

SPACE TRACKS



*"We are a country
awakened to danger
and called to defend freedom."*

President George W. Bush
~~Before a Joint Session of Congress~~
September 21, 2001

The Way Ahead

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"tremendous opportunity"
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Space Support Services

Naval Space Command provides direct space support to Fleet and Fleet Marine Force operational units around the world, whether for routine deployments, exercises, or actions in response to a crisis situation. We take very seriously our duty of ensuring that our Sailors and Marines understand what products are available from space, how to access them, and how to exploit those products in the waging of war and peace.

○ Operational Status/Exercise Support Summaries

Naval Space Command maintains a home page on the Global Command and Control System (GCCS) accessible to operational U.S. military forces worldwide at <http://www.navspace.navy.smil.mil> or <http://206.36.197.25/gccs/home/home.htm>.

○ **Naval Space Operations Center** (540) 653-6500
Call Toll-Free at 1-888-404-6557. Source of space-related operational intelligence. Space reports and analyses are activated on request and are tailored to a deploying unit's operations and geographic area of movement. Tactical assessments of space system capabilities and vulnerabilities to potentially hostile space sensors are also available.

○ **Naval Space Support Teams** (540) 653-6160
Naval Space Support Teams provide tailored information and training at all operational levels to include on-site training, exercise support, and staff augmentation.

○ **Remote Earth Sensing Information Center** (540) 653-6520
Naval Space Command employs imagery from remote Earth sensing satellites to support intelligence, planning, and operations. Our Remote Earth Sensing Information Center (RESIC) — formerly known as the MSI Cell — processes Landsat, SPOT, and Controlled Image Base (CIB) data in support of Fleet and Fleet Marine Force units. Hardcopy and softcopy products, specifically tailored to users' needs, are produced by RESIC and distributed to support forces participating in real-world crisis, operations, and exercises. RESIC products can be produced to support any of the following applications:

Planning	Intelligence Prep of the Battlefield
Target Area Analysis	Mission Rehearsal
Bathymetry	Amphibious Support
Order of Battle Disposition	Supplement MC&G Products
Change Detection	Trafficability
Broad Area Coverage	

Product requests can be submitted via GENADMIN message to: COMNAV-SPACECOM DAHLGREN VA//N313//, via facsimile to DSN 249-6167 or (540) 653-6167, via email to MSI@manta.nosc.mil, or via Naval Space Command's SIPRNET web page.

○ Internet On-Line Access

Naval Space Command maintains a home page on the World Wide Web at URL <http://www.navspace.navy.mil>. Comments or requests for information may be forwarded to the Public Affairs Office via email to gwagner@nsc.navy.mil.

SPACE TRACKS



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ABOUT THE COVER

Military personnel salute as fire and rescue workers unfurl a huge American flag over the side of the Pentagon during rescue and recovery efforts following the Sept. 11 terrorist attack. U.S. Navy Photo by Michael W. Pendergrass.

SPACELINES

Rear Admiral John Cryer Next Commander

Rear Admiral John P. Cryer, III will relieve Rear Admiral Richard J. Mauldin as commander for Naval Space Command in December.

Rear Admiral Mauldin, who has held command since April of this year, has been selected as the U.S. defense attaché to China.

Rear Admiral Cryer currently serves on the staff of the Chief of Naval Operations as the deputy director for the Requirements Assessment Division (N81D) and as director of the CINC Liaison Division (N83C). He will be Naval Space Command's 16th commander.

A native of Jacksonville, Fla., Rear Admiral John P. Cryer III received his officer's commission in 1976 through the Naval Reserve Officer Training Program upon his graduation from Jacksonville University. He was designated a Naval Flight Officer in March 1977.

He trained as an electronic countermeasures officer at Tactical Electronic Warfare Squadron VAQ-129 and subsequently served with VAQ-130 where he made three Mediterranean deployments aboard USS *Forrestal* (CV 59) and USS *Independence* (CV 62).

In May 1981, he was assigned to Air Test and Evaluation Squadron Five where he served as an operational test director

for an improved EA-6B aircraft. His next tour was with VAQ-137 from 1984 to 1987 where he completed two Mediterranean deployments aboard USS *Saratoga* (CV 60), participating in strike operations against Libya.

In May 1987, Rear Admiral Cryer was assigned to the Naval Air Systems Command in Washington, D.C., as the assistant EA-6B program manager. Following this tour in November 1989, he reported to the Naval War College, graduating with distinction.

Subsequently, Rear Admiral Cryer served as executive officer with VAQ-129 and as executive officer and commanding officer for VAQ-141. He deployed to the Mediterranean aboard USS *Theodore Roosevelt* (CVN 71) with VAQ-141 and participated in Operations Provide Promise, Deny Flight and Southern Watch.

In August 1994, Rear Admiral Cryer reported to the Joint Chiefs of Staff in Washington, D.C. where he served as operations officer until August 1997 and was designated the 1997 Chairman, Joint Chiefs of Staff Action Officer of the Year.

He graduated from the National War College in Washington, D.C., in June 1998 and subsequently commanded Electronic Attack Wing, U.S. Pacific Fleet. He deployed to Aviano Air Base, Italy in March



Rear Admiral Cryer

1999 with the Electronic Attack Wing, participating in strikes during Operation Allied Force.

Selected for promotion to rear admiral in February 2000, he reported to the OPNAV Assessments Division (N81) in July of that year.

Rear Admiral Cryer holds master's degrees from the Naval War College, Salve Regina University and the National War College. He has 3,200 flight hours in the EA-6B and has executed 750 carrier-arrested landings.



Vice Mayor Gonzalez (second from right) on a tour of the ROTH site hosted by Cmdr. Cole (far right) and Naval Space Command's ROTH program manager Jack Buckingham (far left).

Open House in Puerto Rico

Fleet Surveillance Support Command (FSSC) hosted an open house at its Relocatable Over-the-Horizon Radar (ROTHR) site on Vieques Island, Puerto Rico, this spring. The purpose of the event, conceived by FSSC commanding officer Cmdr. Patricia Cole, was to raise the overall awareness and understanding of the ROTHR system within the local community.

Those attending the open house included the vice mayor of Vieques, Henry Gonzalez, and a handful of other local officials. The visit was structured to promote an open dialogue to address environmental and safety issues and concerns.

New Deputy Commander, Chief Staff Officer Report to Naval

Colonel Raymond Adamiec became Naval Space Command's ninth Marine deputy commander in August. He succeeds Col. John T. Hill, who retired in July.

Col. Adamiec reports from his previous duty as assistant chief of staff for the Aviation Logistics Department for Marine Forces Pacific.

Originally from Chicago, Ill., he began his Marine Corps career in 1969 as an enlisted recruit and was trained in avionics as an electronic countermeasures technician.

After tours with VMJ-2 at Cherry Point, N.C., and Headquarters & Maintenance Squadron H&MS-14, he was selected to the Naval Enlisted Scientific Education Program. He received his officer's commission in 1975 after graduating from Marquette University.

In subsequent tours, Col. Adamiec served with H&MS-24 in Hawaii and later with Marine Fighter Attack Squadron VMFA-212. During a WestPac deployment, he served as the squadron supply officer in Japan and Korea.

Returning to Hawaii, he served with Marine Air Group MAG-24 as stock control officer, squadron support officer and automated data processing officer. While in Hawaii, he rejoined VMFA-212 in October 1979 and made his second WestPac deployment.

In January 1981, Col. Adamiec transferred to the Marine Aviation Training Support Group in Meridian, Miss. He served as the administrative officer, executive officer and commanding officer for the Aviation Supply, Aviation Maintenance Administration, and Aviation Operations Enlisted Schools until his selection in 1984 for an advanced degree program.

Col. Adamiec attended the University of Illinois, in Champaign, Ill., and obtained a master's degree in mathematics with an operations research specialty. Subsequently, he was assigned to HQMC Installations and Logistics Branch as a logistics analyst from July 1986 to July 1989. He then served with MAG-39 at Camp

Pendleton, Calif., as the executive officer for MALS-39.

Col. Adamiec was transferred to I MEF in April 1992 and assumed duties as plans and operations officer and I MEF aviation logistics officer. During Operation Restore Hope, he served as liaison for Commander Joint Task Force Somalia and MARFOR-PAC to the Commander in Chief, Central Command.

Col. Adamiec was the commanding officer for MALS-11 in El Toro, Calif., from December 1993 to July 1995. He subsequently attended the Naval War College



Col. Adamiec



Cmdr. Blake

in Newport, R.I., where he obtained a master's degree in national security and strategic studies prior to returning to MARFOR-PAC as ACOS for Aviation Logistics.

Cmdr. Cheryl D.

Blake has reported to Naval Space Command as the new chief staff officer.

Her new assignment is Cmdr. Blake's second tour at Dahlgren. She served with the Naval Space Surveillance System (NAVSPASUR) at Dahlgren in 1984 as the Fleet Support Officer, Communications Division Officer and Special Intelligence Division Officer.

Interservice Space Training

Interservice Space Intelligence Operations Course (ISIOC)

The ISIOC is offered at the SI/TK level to military and civilian personnel (O-4 and below) in all the armed services who work as space system operators.

14 JAN - 25 JAN 02	29 APR - 10 MAY 02
04 FEB - 15 FEB 02	03 JUN - 14 JUN 02
25 FEB - 08 MAR 02	08 JUL - 19 JUL 02
19 MAR - 28 MAR 02 (Dahlgren, Va.)	16 SEP - 27 SEP 02
08 APR - 19 APR 02	

Interservice Space Intelligence Operations Senior Course (ISIOSC)

A condensed version of ISIOC, the ISIOSC is offered for senior officers, O-5 and above, also at the SI/TK level.

21 MAY - 24 MAY 02

Interservice Space Fundamentals Course (ISFC)

The ISFC is offered to Army, Air Force, Navy and Marine Corps officers, enlisted personnel and civilian employees entering non-operator staff positions who need to be knowledgeable of space operations, activities and environment. This course covers a fundamental presentation of the physical environments of space and the potential effects on manned and unmanned space systems. ISFC is offered at the Secret clearance level.

14 JAN - 25 JAN 02	29 APR - 10 MAY 02
04 FEB - 15 FEB 02	03 JUN - 14 JUN 02
25 FEB - 08 MAR 02	08 JUL - 19 JUL 02
08 APR - 19 APR 02	16 SEP - 27 SEP 02

All courses are conducted at the Air Education and Training Center in Colorado Springs, Colo., unless otherwise noted. To obtain a quota, or for further information, contact Bonnie Watson at (540) 653-5151, DSN 249-5151, or email bdwatso@nsc.navy.mil. The following information is needed to obtain a quota: name, rank/rate, Social Security number, UIC, billet title and phone/FAX.

Space Command Headquarters Staff

Her tour with NAVSPASUR was her first Navy assignment after she received her Navy commission through the NROTC program, following her graduation from Miami University in Oxford, Ohio, with a bachelor's degree in systems analysis.

Cmdr. Blake went on to serve with the European Command (EUCOM) Data Services Center in Stuttgart, Germany, as the ADP Security Officer for the World Wide Military Command and Control System, the Department of Defense Intelligence Information System (DODIIS) and several other systems.

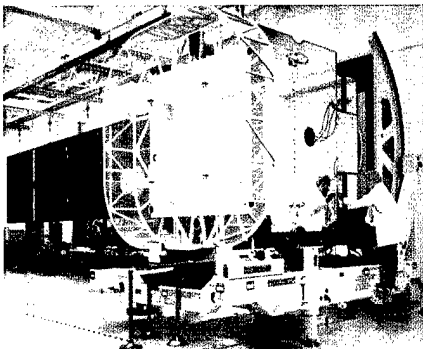
She left EUCOM in 1991 to attend the Naval Postgraduate School in Monterey, Calif., where she completed a master's degree in computer systems management.

In 1992, Cmdr. Blake reported to the Naval Satellite Operations Center (NAV-

SOC) at Point Mugu, Calif., as deputy and later as head of the Operations Directorate. As such, she was responsible for the operation of the Navy Navigation Satellite System (known as TRANSIT) and the Fleet Satellite Communications system. Her directorate also provided anomaly detection and resolution for the UHF Follow-On communication satellite system.

From April 1996 to December 1998, Cmdr. Blake served as officer in charge of Naval Radio Station (Transmitter) Jim Creek at Arlington, Wash., providing VLF communications services to the Pacific Fleet.

Following her tour as OIC, Cmdr. Blake served as the executive officer of Naval Computer and Telecommunications Station, Jacksonville, Fla., her last assignment prior to joining Naval Space Command.



The UHF F/O F-10 spacecraft is pictured undergoing prelaunch testing. Boeing Photo

Navy Orders Eleventh UHF F/O Spacecraft

The Navy has authorized Boeing Satellite Systems, Inc. (BSS) to begin production of the 11th in a series of UHF Follow-On (UHF F/O) satellites, which provide global communications for U.S. armed forces.

The agreement amends an existing \$1.9 billion contract under which BSS has built and launched 10 UHF F/O satellites. The 11th spacecraft (F-11) will be launched in 2003.

The Navy began replacing and upgrading its UHF satellite communications network during the 1990s. In 1999, the Space and Naval Warfare Systems Command granted BSS initial funding for long-lead parts procurement and related activities on UHF F/O-11. With this authorization to proceed with F-11's construction, the Navy is moving to sustain the UHF F/O constellation into the latter part of this decade.

F-11 will use the Boeing 601 satellite bus, like the previous UHF F/O spacecraft. It will carry a UHF payload for narrowband two-way battlefield connectivity, and an EHF payload. The high-capacity EHF subsystem provides enhanced anti-jam telemetry, command, and broadcast and Fleet interconnectivity communications, using advanced signal processing techniques.

The most recent UHF F/O satellites — starting with F-8 — also carry a high-capacity global broadcast service (GBS) payload, which uses commercial-like direct broadcast satellite technology to provide critical information to U.S. and allied forces.



Naval Space Reservists from NR SPAWAR HQ Unit 0366, NR NAVSPACECOM 0766, and ONI (left photo) provided mensuration support using Precision Targeting Web (PTWeb) aboard USS Coronado during Limited Objective Experiment Three (LOE-3) in preparation for Fleet Battle Experiment India. Pictured from left to right are Lt.Cmdr. Mike Shackelford, ISC Janice Battaglia, IS2 Matthew Allen and Lt.Cmdr. John Manser. Photo courtesy PH2(SW) Michael McCormick (USS Coronado). Lt.Cmdr. Steven Briese of NR NAVSPACECOM 0766 (right photo) is demonstrating the use of the Radiant Ether software to EW2 Ramon Perez on board USS Stout (DDG 55). Lt.Cmdr. Briese sailed with the USS Enterprise battle group for 18 days this spring providing Radiant Ether training on board Stout, USS Thorn (DD 988), USS Philippine Sea (CG 58) and USS Gettysburg (CG 64). Radiant Ether is a CNO project that is a proof of concept for future network delivery of tactical broadcast data. Radiant Ether provides enhanced situational awareness for combatants not equipped with tactical broadcast receivers.

Photo and report courtesy Lt.Cmdr. Steve Briese.

SPACELINES

Surveillance Station Supervisors Convene at NAVSPACECOM

Technical supervisors from Naval Space Command's space surveillance field stations met in Dahlgren, Va., for a three-day conference on May 8-10.

Each of the nine field stations that comprise the space surveillance system has a technical supervisor on location to oversee the operation and maintenance of electronic equipment as well as antenna components at the sites.

Naval Space Command hosted the conference to provide the technical supervisors with information on current and future space surveillance issues and to promote an exchange of technical information on current radar system maintenance, common problems and new test equipment and troubleshooting techniques.

According to Sam Estill, program manager for the space surveillance system, the complexity of some of the equipment now in place at the field stations is increasing.

"Much of the electronics, such as network analyzers and calibration system equipment, that we are using now each has its own microprocessor built in," ex-



Dave Perrussel (left) demonstrates an RF channel device for technical supervisors (second from left) Russell Donalson, Andy Shurley and Randall Lyons. The instrument converts data from the space surveillance antenna into a form computers can process.

plains Estill. "It takes a lot more technical know-how to operate the sensor than it has in the past."

The conference also provides an opportunity for field station personnel from across the country to meet each other and the Naval Space Command members they work with. "It puts a face with the person on the other end of the telephone or email," comments Estill.

Held every other year, attendance by field station personnel at the conference is rotated between the station managers and technical supervisors. For this year's

conference, most of the technical briefings by NAVSPACECOM Space Surveillance Program office personnel were copied to CD to enable training for all field station personnel on an on-going basis.

"Meeting and getting to know personnel from the other field stations allows them to compare similar technical problems and situations, and identify another source of expertise or help," observes Estill.

Current technical supervisors for the field stations are Russell Donalson for San Diego, Calif., Ronald Black for Gila River, Ariz., Calvin Green for Elephant

Butte, N.M., Ralph Widner for Lake Kickapoo, Texas, John Buehler for Red River, Ark., Randall Lyons for Silver Lake, Miss., Frank Bullard for Jordan Lake, Ala., Andy Shurley for Hawkinsville, Ga., and Norman Threatt for Tattall, Ga.

Naval Space Command staff members that provided briefings or demonstrations were David Perrussel, Edward Kerrigan, Jimmie Thigpen, Brent Maney, Roy Braddy, Jim Flowers, Alan Bauer, Ed Lydick, Dr. Paul Schumacher, Jonathan Boers, and George Buffkin.

Precision Carrier Approach and Landing System Uses Space Navigation Satellites

By JOC Dave Fliesen
USS *Theodore Roosevelt*

Naval Aviation entered a new era earlier this year as the Navy's Joint Precision Approach and Landing System (JPALS) program set a historic first.

An F/A-18A Hornet touched down on board USS *Theodore Roosevelt* (CVN 71) performing the first fully automated landing at sea using Global Positioning System (GPS) satellites.

The F/A-18A Hornet was piloted by Lt. Cmdr. Chris McCarthy of Naval Strike Aircraft Test Squadron, Patuxent River, Md. The JPALS program developed this capability to perform automated landings at sea using GPS instead of radar.

"We successfully completed four approaches: two at the No. 3 wire and two at the No. 4 wire," explained Glenn Colby, JPALS research and engineering team leader. Colby said that was right where they were aiming with this demonstration.



An F/A-18C Hornet approaches the flight deck of USS *Theodore Roosevelt* for a fully automated landing using GPS satellites. Photo by PHC(FMF)

Dennis Taylor

"This is the first new technology to be introduced for automatic landings since the ACLS (Automated Carrier Landing System) was developed in the 50s," said Colby.

The new JPALS provides constant 3-D coverage for up to 100 aircraft at a range of as much as 200 nautical miles. It is more interoperable as well — adding precision approach capability to more than 300 ships and at commercial airfields around the country.

JPALS offers many improvements. It can be used for precision approaches on LHA/LHD classes of amphibious ships and for training at international airports. JPALS also provides 3-D coordinates around the carrier, providing autonomous vehicle navigation in support of the Unmanned Combat Aerial Vehicle (UCAV).

"Our task was to develop the architecture and define the requirements for JPALS — and we've done that," said J.B. Patterson, acting JPALS Integrated Product Team leader.

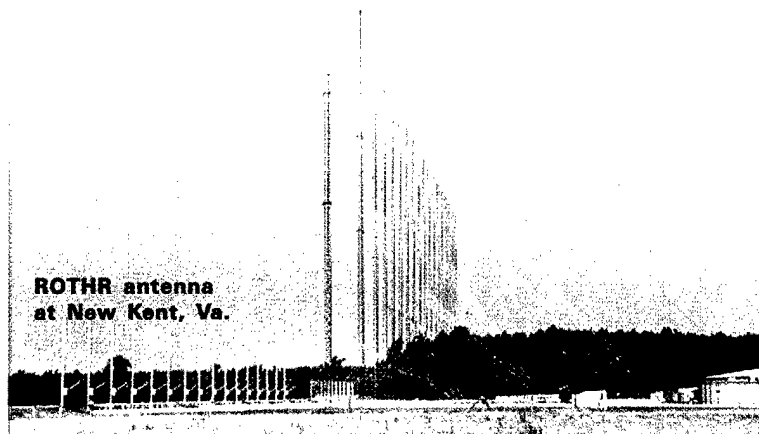
JPALS is a joint program with the U.S. Air Force as the executive service, responsible for the development and testing of the shore-based application.

Colby said that the Air Force would conduct tests at Holloman Air Force Base to evaluate the shore-based performance and jamming capabilities. The Navy is testing the version of the system that will be used aboard ship.

Patterson estimates the JPALS program will save the Navy \$1.9 billion over a 20-year lifecycle.

"Double that lifecycle to 40 years (the lifetime of ACLS)," Patterson said, "and you've saved enough to buy a super carrier. It's important for the funding decision makers to see what we're doing out here."

He said JPALS is scheduled to begin production in 2007, install in 2008 and enter the fleet by 2009. It will first be placed in seven AV-8 Harrier STOVL (Short Take Off and Vertical Landing) aircraft and on one of the LHA/LHD class of amphibious ships. — *Navy Wire Service*



RIBBON CUTTING MARKS RETURN TO NORMAL OPERATIONS

ROTHR Virginia Site Rebuilt Following Fire

Fleet Surveillance Support Command (FSSC) celebrated the full recovery of its Relocatable Over-the-Horizon Radar (ROTHR) transmitter site in New Kent, Va., with a ribbon-cutting ceremony on May 15.

FSSC operates and maintains three ROTHR sites in support of the nation's efforts to interdict the flow of illegal drugs into the United States. The three radar sites are located in Virginia, Texas and Puerto Rico.

Each ROTHR site is actually made up of two individual locations: a transmitter site and receiver site physically separated by 50 to 90 miles, giving the radar the term bi-static. All information gathered by the three radar sites is fed to an Operations Control Center located at FSSC headquarters in Chesapeake, Va.

Raytheon Corporation is the primary contractor employed for the actual operation and maintenance of all systems. Navy personnel along with DoD civilians administer and oversee the Raytheon contract and also act as the direct link to all end users of the radar data.

On Aug. 20 last year, a local resident was driving past the ROTHR Virginia transmitter site on his way home and noticed smoke in the vicinity of the antenna.

He alerted onsite personnel and they in turn investigated the smoke to find an electrical fire running through an above-ground cable tray assembly.

Local authorities along with onsite personnel were able to quickly extinguish the fire without injury or loss of life, but not before \$1 million dollars in damage had occurred. Half of the site's 16,000 feet of cable trays had been severely damaged, and the site was no longer operable.

The Virginia ROTHR system is the site primarily responsible for surveillance of the western portion of the Caribbean Sea known as the "Transit Zone." After the mishap that radar coverage in the region was significantly reduced.

"This was a great blow to the counter-
(Please see Ribbon Cutting on page 8)



Damage to the cable trays from the electrical fire at the Virginia ROTHR site was extensive.

SPACELINES

RADAR PERFORMANCE ENHANCED IN RECOVERY EFFORT

Ribbon Cutting

(Continued from page 7)

drug community which depends on this, the United States' only over-the-horizon radar system ... that constantly surveils the Caribbean Ocean and the northern coast of South America for drug-running aircraft," stated Cmdr. Patricia Cole, commanding officer for FSSC, during the recent ribbon-cutting ceremony.

"It is because our system can do this surveillance over such a large area that our country's interdiction efforts are making real headway in the war on drugs," said Cmdr. Cole.

The decision was made not to effect permanent repairs at that time, as that would require an extended down time for the radar. Engineers with Raytheon Corp. responded quickly and were able to bring the radar back on line in less than a week. They used the remaining undamaged cables to reconfigure the crippled site and enable FSSC to continue to provide law enforcement agencies with vital information during a time known for high trafficking efforts, and also to continue support for scheduled, high-profile R&D testing.

On Jan. 15 this year, ROTH Virginia was taken off line for repair. This repair effort was to be quite extensive allowing for complete replacement of all existing cable trays, cables, and groundings. Some 12,400 feet of enclosed cable trays containing 49,600 feet of cable had to be replaced.

The decision was also made to update the radar site with other enhancements and further utilize the down time to accomplish a complete system "tune-up." One example of this is represented by the laying down of some 10.5 million linear square feet of radial wire around the antenna, ultimately giving a better beam of energy in the transmission path.

All cable work for the actual repair, to include follow-on testing and calibration, was scheduled to take approximately 120 days, weather permitting.

The cable trays were installed by mid-March. At that point, phase calibration for all cables and connectors was initiated. In addition, new ground screen radials were installed. Radials of 15 degrees, 45 degrees and 75 degrees covered 10.5 million linear feet to further enhance ROTH system performance.

FSSC was anxious to bring the radar



FSSC commanding officer Cmdr. Patricia Cole and John Schell, vice president of range technical services for Raytheon, share in the ribbon-cutting formalities at the ROTH site.

back on line with the new enhancements and once again provide a very important information link to all law enforcement agencies in the fight against drug transport into the United States.

During the ribbon-cutting ceremony at the New Kent site, held four months to the day from the start of repairs, Cmdr. Cole applauded the efforts by command members and Raytheon employees that ensured the ROTH site was down for a minimal amount of time.

Midshipmen Take In Space



Members of the Naval Academy's Class of 2004 study samples of multi-spectral imagery generated by Naval Space Command for Fleet and Fleet Marine Force units during a visit to Dahlgren as part of their summer tactical training program. A total of approximately 500 Midshipmen visited NAVSPACECOM this summer.

Space Tracks Receives CHINFO Merit Award

Space Tracks, Naval Space Command's quarterly news magazine, was awarded the Chief of Information (CHINFO) 2000 Merit Award for exemplary achievement and professional excellence in journalism. This is the second time *Space Tracks* has received a CHINFO Merit Award, which is the Navy's highest honor for internal print and broadcast products by Navy commands and individuals.

Space Tracks received an honorable mention in the "military-funded newspaper, magazine format" category.

CHINFO Merit Awards are made annually by a panel of military and civilian judges who evaluate layout and design, content quality, writing, editing, photography and quality of production.

Space Tracks earned its first CHINFO Merit Award in 1995, finishing with an honorable mention in the news or news-feature magazine category.

Naval Academy Spacecraft to Aid Amateur Radio Operators

The first satellite designed and constructed by midshipmen under the auspices of the U.S. Naval Academy's Small Satellite Program was launched into orbit on Sept. 29 from the Kodiak Launch Complex in Kodiak, Alaska.

The Prototype Communications Satellite (PCSat) will serve as a worldwide position/status reporting and message communications satellite for users of the Amateur Position Reporting System. Participants in the spacecraft project have come from each of the Academy's classes of 1999 through 2001.

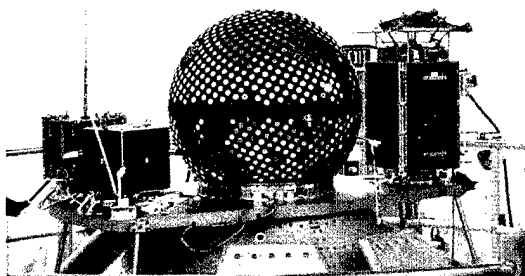
Retired Cmdr. Robert Bruninga, operations officer and engineer at the Naval Academy Satellite Ground Station, developed the Amateur Position Reporting System, a network of volunteer amateur radio stations that receive and re-transmit digitized data packets ("digipeating") for amateur radio operators.

PCSat also carries a Global Positioning System (GPS) receiver developed by the German Space Operations Center for NASA's Wallops Island Flight Facility. PCSat will be the first satellite to report its exact location directly to users from its onboard GPS receiver so that users who do not have tracking software can determine the position of the satellite whenever it is in view.

"We hope that PCSat will be a new direction for amateur satellites by serving the communication needs of travelers with mobile or hand-held radios anywhere on earth," said Cmdr. Bruninga.

PCSat will be accessible to licensed amateur radio operators with commercially available APRS equipment at 144.390 megahertz.

Representatives of the Department of Defense's Space Test Program (STP) and NASA certified PCSat "flight ready" after a flight readiness review held at the Academy in July. "The Naval Academy has done a remarkable job of pulling this satellite project together and getting it ready for flight in such a short amount of time," said Air Force Lt. Col. Perry Ballard, acting program director of STP, which sponsored the launch of PCSat.



The payload upper deck is shown just prior to encapsulation. PCSat is in the left foreground, Sapphire at left rear, NASA's Starshine is in the center, and STP's PicoSat is on the extreme right.

The spacecraft was launched into an 800-kilometer circular orbit aboard a Lockheed Martin Athena I solid-fuel rocket along with three other payloads: Sapphire, a joint effort between the Naval Academy, Stanford University and Washington University at St. Louis; Starshine III for NASA; and PicoSat for the Air Force Research Laboratory. The launch was the first from the Kodiak

More on the Naval Academy's space program on page 12.

Launch Complex to place satellites in orbit.

Following the launch, on-orbit telemetry and control of both the PCSat and Sapphire spacecraft was transferred to the Naval Academy's satellite ground station in Annapolis, Md.

Construction of PCSat was made possible by a grant from The Boeing Company through the U.S. Naval Academy Foundation. Stanford University designed and constructed Sapphire, which has been donated to USNA for inclusion on

this launch. Washington University at St. Louis prepared Sapphire for launch. The Naval Research Laboratory performed critical flight acceptance tests for both satellites.

PCSat carries four 19-inch flexible steel tape antennas that must be folded and stowed during launch and extended automatically upon spacecraft deployment. This was the first use of this experimental release mechanism in space flight. — *Story and Photos Courtesy Trident Newspaper, U.S. Naval Academy*



Naval Academy team members prepare PCSat for its assembly with the Athena 1 launch vehicle upon the spacecraft's arrival at the Kodiak Launch Complex in Alaska.



SPACE BILLETS



OFFICERS The following is a partial list of officer billets with space missions, whose incumbents are scheduled to transfer between now and March 2002. For specific billet information and actual availability dates, contact your detailer.

Billets With Subspecialty Code XX76 (Space Systems - Operations)

ACTIVITY	TITLE	BDES	BGRD	BSUB1	BSUB2	AVAIL
OPNAV	COMM PLN&OPS/N60C ASST	1000	LCDR	0089R	0076S	20011201
USSPACECOM	MRP/IPL OFF 5520/02	1050	LCDR	0076P		20011201
USN ELEMENT NRO	DP DR JT SUP ML OPS	1050	LCDR	0076B	0046B	20011201
OPNAV	COMM PLN&OPS/N60C ASST	1000	LCDR	0089R	0076S	20011201
USSPACECOM	MRP/IPL OFF 5520/02	1050	LCDR	0076P		20011201
USN ELEMENT NRO	DP DR JT SUP ML OPS	1050	LCDR	0076B	0046B	20011201
OPNAV	SPACE ACQ/ASST FOR IMAGERY	1630	LCDR	0076P		20011201
NAVSPACECOMOPSEL	OP INTEL ANAL/FLEET SPACE	1630	LT	0076B		20011201
OPNAV	OP INTEL MGT/N2K2 ASST	1000	LT	0075S		20020101
USSPAC CB OPSTAF	SPEC ANAL 9361/02OFF	1050	LT	0076S		20020101
USSPAC CB OPSTAF	MSL INT OFF 9520/05	1100	LT	0076S		20020101
OPNAV	OP INTEL MGT/N2K2 ASST	1000	LT	0075S		20020101
USSPAC CB OPSTAF	SPEC ANAL 9361/02OFF	1050	LT	0076S		20020101
NSGA SGROVE	36 NSG OPS/OPS OFF	1610	LT	0076P		20020101
NSGCD DET POT DC	58 CLASSIC WIZ OPS/ LIAISON	1610	LT	0076P		20020101
USSPAC CB OPSTAF	CH TRANSCOM JSST	1000	CDR	0076P		20020201
USSPAC CB OPSTAF	EUCOM/TRANSCOM SPT	1050	CDR	0076P		20020201
USN ELEMENT NRO	EXER ACT	1050	LCDR	0046B	0076B	20020201
USSPAC CB OPSTAF	DEP CMDR	1100	LCDR	0076R		20020201
OSD	FOREIGN AFFRS SPEC	1310	CAPT	0075P		20020201
USSPAC CB OPSTAF	CH TRANSCOM JSST	1000	CDR	0076P		20020201
USSPAC CB OPSTAF	EUCOM/TRANSCOM SPT	1050	CDR	0076P		20020201
USSPAC CB OPSTAF	DEP CMDR	1100	LCDR	0076R		20020201
USN ELEMENT NRO	EXER ACT	1050	LCDR	0046B	0076B	20020201
USN ELEMENT NRO	DP DR SUP NATL OPS	1050	LCDR	0076B	0046B	20020301
USN ELEMENT NRO	NATL SYS CUSTOMER REP	1050	LT	0076B		20020301
USN ELEMENT NRO	DP DR SUP NATL OPS	1050	LCDR	0076B	0046B	20020301
USN ELEMENT NRO	NATL SYS CUSTOMER REP	1050	LT	0076B		20020301

Billets With Subspecialty Code XX77 (Space Systems - Engineering)

ACTIVITY	TITLE	BDES	BGRD	BSUB1	BSUB2	AVAIL
SPAWARSYCOM PMO	MGR DPJ FE/APM FOR ACQUIS	1510	CDR	0077P		20011201
SSFA	DEP DPJ MGR/DEP SPECIAL SYS	1510	CDR	0077P		20011201
SPAWARSYCOM PMO	MGR DPJ FE/APM FOR ACQUIS	1510	CDR	0077P		20011201
DISA D6 JIEO	CH 1A MULT SEC JEDBC/01 LVL	1000	CDR	0077P		20020101
SSFA	SPACE PJ TECH/SYSTEMS ENG	1000	LT	0077P		20020101
DISA D6 JIEO	CH 1A MULT SEC JEDBC/01 LVL	1000	CDR	0077P		20020101
NCCOSC RDTEPNWCF	OIC SHR ACTY	CDR	0077P	0055R		20020101
SPAWARSYCOM PMO	DPJ SUP/ASST PM FLEET INTRO	1050	LT	0077B		20020201
SSFA	DEP SPACECRAFT ACQ MGR	1510	LCDR	0077P		20020201
SPAWARSYCOM PMO	DPJ SUP/ASST PM FLEET INTRO	1050	LT	0077B		20020201
SSC SDGO NWCF	ELXEQ RSCH/PROJ OFF	1440	LCDR	0077P	0055S	20020201
SSFA	DEP SPACECRAFT ACQ MGR	1510	LCDR	0077P		20020201
USSPACECOM	ELEC ENG	1050	LT	0055P	0077S	20020301
SSFA	TACTICAL SYS ACQ PJ MGR	1512	LCDR	0077P		20020301

ENLISTED BILLETS

AT NAVAL SPACE COMMAND
DAHLGREN, VIRGINIA

Following is the allowance for enlisted personnel at Naval Space Command, Naval Surface Warfare Center Dahlgren Division, Dahlgren, Va. Dahlgren is located approximately 50 minutes from Washington, D.C., and three hours from Norfolk, Va. The base is also home to the Aegis Training & Readiness Center and the Navy's only active gun testing range. You will also find a small Navy Exchange, commissary, gymnasium, auto and wood hobby shops, year-round pool, library, chapel, theater, and numerous outdoor recreation facilities. If you would like more information about one of the Navy's "best kept secret" duty stations, or would like a welcome aboard package, feel free to contact the Command Master Chief, CMDMC (SS) Alan P. Steiner. Master Chief Steiner can be reached at DSN 249-6115 or commercial (540) 653-6115 (email address: asteiner@nsc.navy.mil). If you are interested in receiving orders to Naval Space Command, contact your detailer.

CTA: E7:1 E6:2 E5:2 E4:1
CTR: E6:1 E5:2
EA: E7:1
ET: E7:2 E5:4 E4:2
EW: E8:1 E5:2 E4:2
FC: E6:1
IS: E7:1 E6:2 E5:4 E4:3
NC: E7:1
OS: E7:3 E6:5 E5:3 E4:13
RM: E7:2 E6:3 E5:9 E4:1
SK: E5:1
YN: E6:1 E5:2*

*One YN2 billet is TAR.

Space Commission Ushers In "Time of Tremendous Opportunity"

The Way Ahead For Naval Space

2001 has been a remarkable year for our military space program — the beginning of a real-world odyssey intended to ensure that the United States retains its position as the world's leading space-faring nation into the 21st century.

We have undertaken a journey set in motion in January with the release of a report by the Commission to Assess United States National Security Space Management and Organization. Secretary of Defense Donald H. Rumsfeld endorsed the commission's recommendations this spring and directed that DoD restructure its space management and organization "to promote and protect our interests in space."

Key to the secretary's restructuring plan was the decision to designate the Air Force as the executive agent for space within DoD, with department-wide responsibility for planning, programming and acquisition of space systems. However, at the same time, Secretary Rumsfeld directed that the Army and Navy "continue to establish requirements, maintain a cadre of space-qualified officers, and research, develop, acquire and deploy space systems unique to each service."

A Stake For All

Space is an integral part of any military operation today — on land, on the sea, in the air and under the sea. For that reason, space must be incorporated into all operational planning, and the methods and technology we employ in using space must be interoperable across all the services, as well as our allied/coalition forces. I believe Secretary Rumsfeld's initiatives in response to the commission's findings have underscored this point.

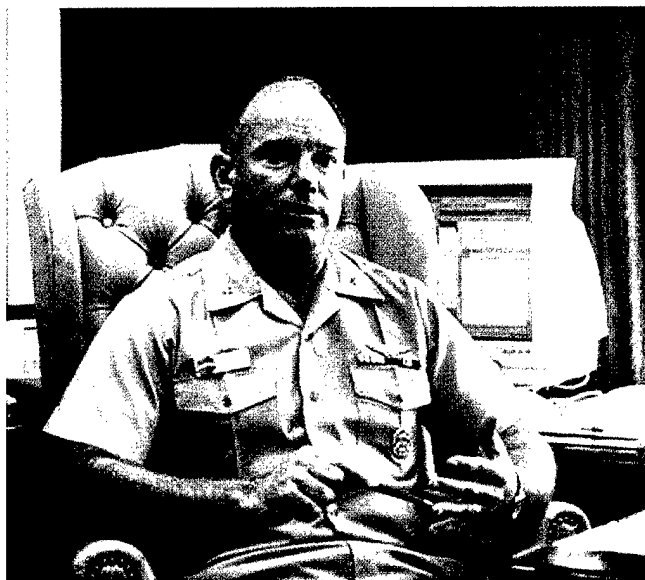
All the services will continue to have a stake in space. Army and Navy will continue to manage their programs and bud-

By Rear Admiral Richard J. Mauldin

gets. And all services have been directed to conduct space-related research and development. From my perspective, we are entering a time of tremendous opportunity. What I expect to gain is an increased synergy and cooperation among the services with better coordination be-

on requirements, and USCINCSpace still is the space operations authority. We will all continue to rely on established organizations and procedures to accomplish fair and equitable treatment of space.

I'm very certain about one thing: space is an integral part of the way in which naval forces operate today and will become increasingly so in the future. Potential theaters of operations are diverse



"We fully understand that the future effectiveness of the United States naval services is linked ... to our ability to exploit the resources available to us through the medium of space"

— Rear Admiral Mauldin

tween the various facets of space programs, both space segment and terminals.

The truth is that the Air Force has been the lead service for space for years, with the bulk of the dollars, people and programs in space. However, Navy has had many successful efforts, such as our latest satellite communications program, the UHF Follow-On. This is a naval program designed to meet naval and joint requirements which established new ways to acquire DoD space systems. It used a single multi-year contract to deliver 10 satellites on orbit via commercial launch in a turn-key manner.

Because the Navy and the Air Force operate within different mediums and with different platforms, there will always be some differences in priority. But OSD still maintains the ultimate authority, the Joint Staff and the Joint Requirements Oversight Council (JROC) still is the authority

with varying degrees of support. To succeed at our mission, we must arrive on scene prepared and ready to fight. Also, the complexity and range of modern weapons systems demand instantaneous and complete information. Only space has the capacity and flexibility to support our demands.

Scratching the Surface

Without space we would pretty much lose all communications beyond line of sight. We would lose intelligence data that gives us targeting information, battle damage assessments, positioning and timing data critical to networked operations, weather data that tells us what to expect of weapons performance ... just to name a few items.

At the outbreak of Desert Storm, most of our platforms had little more than UHF

(Please see Mauldin on page 13)

Entering the Realm of Space

By Martha Thorn

It sounds like something out of science fiction ... interstellar travel to Pluto, an analysis of the surface composition of Pluto and an aeronautical almanac to aid with celestial navigation on the surface of Mars.

Yet, when Rear Admiral Richard J. Mauldin, commander for Naval Space Command, shakes the hand of Midn. 1/C Jason Smith and says, "Nice brief!" the brief moves from the realm of the imagination into the realm of possibilities.

Earlier this year, Rear Admiral Mauldin and NAVSPACECOM staff members visited the Naval Academy to hear briefings by aerospace engineering majors on their space projects. The visit was part of NAVSPACECOM's annual review of the academy's space curriculum. The command sponsors a space research chair in the academy's Aerospace Engineering Department.

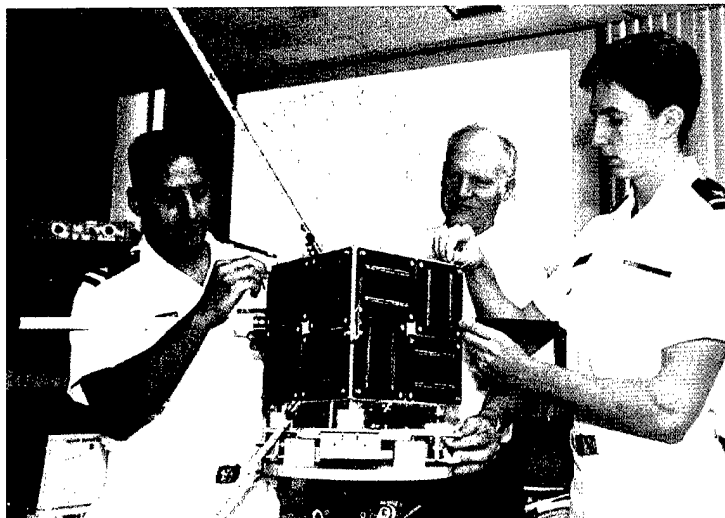
The midshipmen talked about putting

an antenna on the roof of Rickover Hall, using the academy's satellite earth station to receive data from their experiments aboard a space shuttle, and using already operational Air Force and NASA satellites and designs.

The cost of building the projects ranged from nearly \$3 billion to \$27,000, but the midshipmen remained unfazed by the big bucks.

Midn. 1/C James Santiago joked that the Navy Federal Credit Union would help with the \$100,000 needed to build their project, and the group could be flexible on the solar cells which amounted to \$75,000 of the allotted budget.

Underneath the levity, a thread of seriousness existed, because one of the three presented designs will be built and launched aboard a space shuttle.



U.S. Naval Academy Photo



Trident Scholar Midn. 1/C Robert Gallagher and Professor Robert Ferrante adjust equipment in their radiation-induced processing of hydrocarbons project. Photo Courtesy NASA/Goddard Space Flight Center

Command-Sponsored Curriculum Brings Space Technology to Forefront

Naval Space Command has sponsored a space research professorial chair at the Naval Academy since 1985. The space chair was established to support the academy's astronautics curriculum and to "provide the mechanism by which midshipmen and faculty members will become exposed, involved and committed to scientific activities at the forefront of the technologies related to space systems."

In advocating Naval Space Command's sponsorship of the new space research chair, then commander Rear Admiral Richard H. Truly emphasized that such an effort "is in keeping with the command's mission to help develop educational programs that will provide the specialized training needed to increase the number of space-qualified naval personnel."

Prompted in part by the Navy's growing commitment to space, the faculty of the academy's Aerospace Engineering Department started putting together an undergraduate program in astronautical engineering in 1983. The new program was structured to provide two separate engineering "tracks" that would allow midshipmen majoring in aerospace engineer-

ing to now emphasize either aeronautical or astronautical topics in their studies.

The astronautical track was structured to give engineering graduates an academic background that will enable them to manage space-related design and procurement programs for the Navy. New courses developed by the academy for the astronautics track included classes in spacecraft systems, space environment, astrodynamics, attitude dynamics and control, spacecraft thermal control and spacecraft design.

The first courses in the astronautics program were offered to midshipmen during the 1984-85 academic year. Over the past 10 years, an average of 30 midshipmen have graduated each year with an astronautics degree.

NAVSPACECOM also funded the installation of a satellite Earth station antenna at the academy in 1988 to support instruction in orbital mechanics and telemetry and communications exercises. The 40-foot-diameter parabolic dish tracking antenna was donated by NASA's Goddard Space Flight Research Center in Greenbelt, Md.

Ensigns Daniel Boutros (left top photo) and Robert Schwenzer, under the supervision of Bob Bruninga, chief engineer and operations officer of the Naval Academy's satellite ground station, finish assembly of the Prototype Communications Satellite (PCSat).

The group that designed the Naval Academy X-ray Observatory argued that their project should be selected because it would add to the overall body of knowledge. In the year that their project would be operational, they planned to record one solar flare and one gamma ray burst and learn more about how the sun affects the weather.

The Internet Communications Satellite group presented a timeline where the Class of '02 would build the project and the Class of '03 would test and launch it. This project would allow people to feed their latitude and longitude into the Internet and receive a picture from space via e-mail of their general location.

"We're not just another design project," Midn. 1/C James Santiago said of his group's proposal to measure the atmospheric density effects on drag. "They're going to pick ours and it's going to be run by mids."

He asserted that the scientific community would be interested in their study of atmospheric density and solar flux and the spacecraft would succeed for the lifetime of the mission, which he estimated to be from six months to a year.

In addition to the aerospace engineering design projects, three Trident Scholars who were aerospace engineering majors also presented their research. Midns. 1/C John Young, Robert Gallagher and Benjamin Malay talked about their projects which involved the importance of density, the surface composition of Pluto and celestial navigation on Mars.

"It was very educational and very inspirational," said Rear Admiral Mauldin. A business major, he admitted to be incredibly impressed and pledged the Naval Space Command's continued support and sponsorship.

He encouraged the academy to go forward with its information technology initiatives and to persevere in making more people "space literate." — *Photos and Story Courtesy Trident Newspaper, Naval Academy*

The Way Ahead

Mauldin

(Continued from page 11)

narrow-band communications. The average American living room equipped with cable TV had more bandwidth available than our aircraft carriers. To say the least, that has changed. We still are highly dependent on UHF and will be for many years to come. But SHF, EHF, broadcast systems such as Challenge Athena and the Global Broadcast System, as well as commercial communications systems and internet connectivity, have become quite commonplace.

But even with all the vast improvements, trends we are seeing in terms of time-critical strike, network centric operations and imagery-dependent weapons portend that we have barely touched the tip of the iceberg. We are becoming increasingly dependent on space.

Total Navy investment in space is \$567 million for fiscal year 2001. For years, Navy has maintained roughly 5 percent of the total DoD space budget. We do not expect a major change in that level of funding. What we must do is make sure that we continue to correctly articulate

and advocate the critical requirements for space, so that future budgets can be formulated and properly focused to match our needs.

Space Makes Fleets

Present and future naval warfare is inextricably linked to space. In commissioning the Naval Space Command in 1983, then Chief of Naval Operations Admiral James D. Watkins stated, "A globally deployed Navy today needs space systems to make fleets out of ships. Today, and increasingly tomorrow, a seafaring nation also must be a spacefaring nation."

His assessment nearly two decades ago is still valid today. We fully understand that the future effectiveness of the United States naval services is linked inextricably to our ability to exploit the resources available to us through the medium of space as a force enabler, force enhancer, force multiplier and force sustainer.

We intend to continue to integrate space technology into every facet of naval operations to enable our Sailors and Marines to maintain their warfighting edge.



Modern-day shipboard combat direction centers (above) require connectivity to a wide array of space systems to support communications, surveillance, strike, battle damage assessment and other critical operational functions.

U.S. Navy Photo by PH1 Tina M. Ackerman

Naval Space Reserves Play Key Role in Fleet Battle Experiment

UAV Flies Prototype Signals Intelligence System

By Lt. Christopher Nerney

Recently, the Navy Tactical Exploitation of National Capabilities (TENCAP) office, Naval Research Laboratory (NRL), and SPAWAR System Center (SSC-SD) partnered together to successfully demonstrate several prototype signals intelligence (SIGINT) collection systems during Fleet Battle Experiment INDIA (FBE-I) conducted this summer.

Reserve support from Naval Reserve NAVSPACECOM 0766 was provided by Lt.Cmdr. Robert Jelescheff, Lt.Cmdr. Randy Gallagher, and Lt. Christopher Nerney. Each performed overlapping two-week annual training periods and proved to be invaluable in successfully executing the daily test plan.

The Reservists had to become "jacks of all trades" as they were called upon to survey potential target emitter sites, interact with local agencies, set up and take down several large reference emitter antennas on the roof of SSC-SD, as well as assisting NSA's System Performance and Evaluation Lab (SPEL) with set-up and operation of several tactical radio nets.

Single Platform Cueing

The prototype SIGINT collection systems were flown aboard the Naval Postgraduate School's turbocharged ALTUS unmanned aerial vehicle (UAV) over the Camp Pendleton, Calif. area. NRL developed an end-to-end system called COPPERFIELD for collecting electronic intelligence data, while Navy TENCAP developed an airborne collection system called DRAGONFLY, which was used to support two projects — Radiant COPPER II and Radiant COPPER IV. These are efforts devoted to exploring cross-platform geolocation of conventional command and control (C2) radios and those utilizing modern modulation techniques, respectfully.

Target radars and radios were detected and geolocated in near-real-time and reported over the TRAP dissemination broadcast as part of the FBE-I scenario. Geolocations were then used to cue the



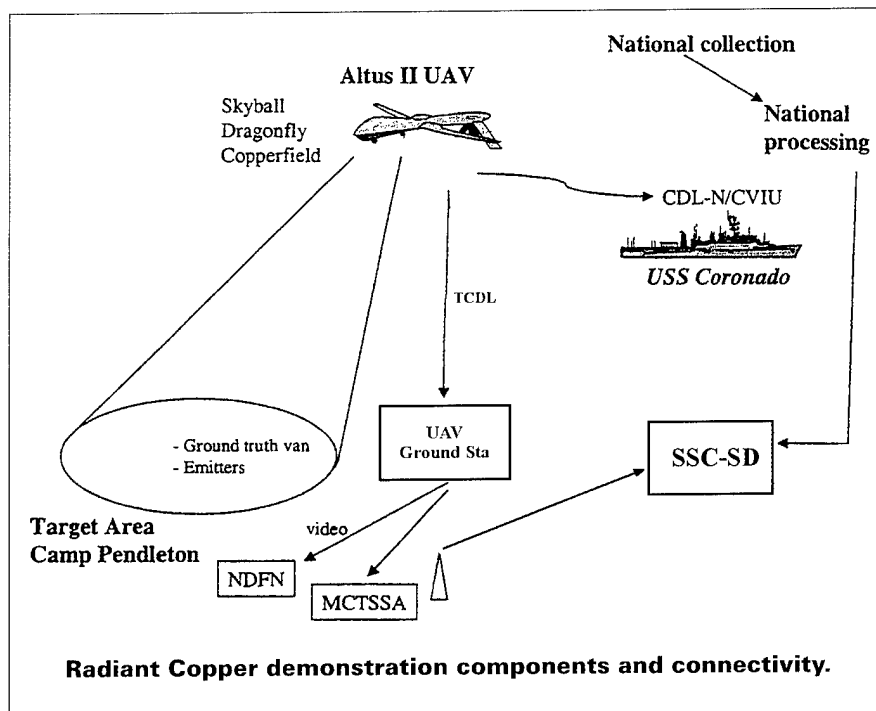
Pictured in front of the Altus UAV are (left to right) Lt.Cmdr. Randy Gallagher, Lt. Christopher Nerney and Lt.Cmdr. Michael Larios.

UAV's electro-optical camera (SKYBALL) and target them. This was the first ever Navy single platform SIGINT cuing of IMINT.

Additionally, the DRAGONFLY system successfully demonstrated interoperability with SPAWAR's Hostile Force Integrated Targeting System (HITS), a developing Fleet-based integrated SIGINT

collection/geolocation system.

NR NAVSPACECOM 0766's support directly contributed to the overall success of Navy TENCAP's demonstrations and typified the "can do" attitude of the Reservists. Supporting exercises and demonstrations, such as FBE-I, is just one of the many ways Navy Reservists support Naval Space Command.



Comprehensive Training Initiative Is A Priority Mission In New Strategy

Focus On Building Space Expertise

Naval Space Command has established a Training and Space Education Division (N7) in its latest move to implement a visionary strategy aimed at developing Sailors' expertise in space-based technology, communications and systems to achieve and maintain knowledge superiority essential for dominating the battle space to support the warfighter.

The newly formed division consolidates functions and positions previously dispersed throughout the NAVSPACECOM organization. This effort presently does not represent an increase in the command's overall staffing level.

Curtis D. Bell has been selected to head the new division. Cmdr. Matthew Rausch, who formerly directed the command's training activities through its Naval Space Support Teams, has been tapped to serve as N7's deputy director.

"The realignment of training and space educational assets within Naval Space Command will allow the command to focus resources better, thereby enhancing the development of naval space expertise worldwide," observes Bell. "Our training objectives will enable us to use 'space' in order to achieve and maintain knowledge and battle force superiority to win conflicts or wars."

The impetus to realign training assets within NAVSPACECOM was rooted in a

reassessment of the command's mission areas led by Rear Admiral Thomas E. Zelibor in March 2000. "We took a hard look at our priorities with respect to resources versus mission areas," reflects Cmdr. Rausch.

Among the key mission areas for NAVSPACECOM validated in the reassessment was the need to develop a cadre of space-knowledgeable personnel in the Navy and Marine Corps. "We found that our available resources were not matching the requirements we had for training and education," says Cmdr. Rausch.

For example, the command's ability to provide space-related training through its Naval Space Support Teams — an outreach effort staffed from in-house personnel that required extensive travel to carrier battle groups — had been curtailed because of operational shortfalls precipitated by a 60-70 percent manning level dictated for naval shore commands.

"We were in a situation where we were not able to do much more than maintain pre-deployment training for battle groups and amphibious ready groups," adds Cmdr. Rausch. "In addition, we were barely able to sustain our efforts at Fleet Training Centers and Naval Education Centers, and most of our other educational outreach had gone on hold."

However, at the time of the review conducted by Rear Adm. Zelibor, efforts were

OS1 Troy Massey (standing) instructs OS2 Brian Weiss as part of Naval Space Command's training program to qualify Sailors to serve as Space Surveillance Officer watchstanders in the Naval Space Operations Center.

already underway to shift the focus of Naval Space Command's training and education initiatives along three directions. First, the command had begun to build an infrastructure that could support expanded use of web-based information technology to reach more Fleet and Fleet Marine Force customers.

Second, working to overcome manpower shortfalls, the command began to explore ways to involve more personnel from other work areas — such as Intelligence Specialists and satellite communications experts in the SATCOM Operations Branch — in educational and training outreach efforts.

Third, the command had started to look for ways it could institutionalize space training in the naval force support structure.

N7's goals and objectives will complement and directly support Naval Space Command's four principal mission areas: performing essential operations, developing space expertise, advocating naval space requirements and fostering technology.

NAVSPACECOM's new Training and Space Education Division is comprised of three branches. The Naval Force Space Education and Training Branch is focused squarely on developing space expertise in the Fleet and Fleet Marine Force, and providing training directly to operational forces.

"The first thrust for us in this area is to raise the awareness among operational naval forces regarding the role that space is taking in their day-to-day operations," observes Cmdr. Rausch. Fleet Sailors need to know how to use leading-edge technology available to them through space systems.

"By the same token, we need knowl-

(Please see Training on page 16)

Space Expertise Critical to Fleet Superiority

Training

(Continued from page 15)

edgeable Fleet operators to provide us with feedback that will enable us to better advocate naval requirements for space systems and products," he adds.

NAVSPACECOM objectives call for guiding the formal education process for naval forces through the use of warfare schools, graduate programs and officer accession programs, with an eye toward helping to guarantee that officers who choose to make space-related fields their profession can do so without jeopardizing their career.

"Our commitment is to ensure that we not only build that cadre of space-smart naval personnel, but that we make them a core part of the naval warfighting repertoire."

"Currently, the Navy process does not promote the opportunity to do both," says Cmdr. Rausch. "Our commitment is to ensure that we not only build that cadre of space-smart naval personnel, but that we make them a core part of the naval warfighting repertoire."

Another objective of Naval Space Command's revamped training and education mission is to more effectively represent "the naval space warfighter story" to the other services and in forums designed to train joint operating forces. N7 will serve as a conduit to ensure naval and joint space expertise remains a valuable commodity to support a cadre of space-knowledgeable personnel in the Navy and Marine Corps.

"With all of us sharing common space resources, it is critical for our staffs to appreciate the involvement and requirements of the other services as we employ limited resources," comments Cmdr. Rausch.

The Training Technology and Product Development Branch will exploit the proliferation of web technology and dis-

tance learning tools to make space education available "on demand" to naval personnel deployed around the globe. This focus addresses operational requirements and tempo unique to the Navy.

"The nature of naval operations makes it impractical to literally station space-smart personnel on the staffs of forward-deployed units," explains Cmdr. Rausch. "The commander at sea rationalizes, 'If you didn't get me smart before the crisis began, then don't disrupt my battle tempo by dropping a non-ship's force member for me to integrate into my ship's crew when things suddenly get hot!'"

Therefore, in its restructured training mission, NAVSPACECOM's focus will be to provide training as part of the pre-deployment cycle, to establish space-smart positions on ship staffs, and to develop a robust reach-back educational and space information capability that can be exploited by underway personnel.

The Command Training and Education Branch rounds out the new division and will function to ensure NAVSPACECOM's internal training requirements are met.

The internal training function becomes critical given the fact that over half of the military staff at Naval Space Command reports aboard without any previous space-related experience. N7 will serve internally and externally the training needs and requirements for space education in keeping with the vision and outcomes of the Space Commission's report supporting the warfighter.

As Cmdr. Rausch observes, "If we do not have an efficient, coherent program for getting our own staff up to speed quickly, we not only lose the ability to employ the staff we have, but we seriously jeopardize the quality of the work we do within the space community and in bringing space expertise to the Fleet."

"We understand that the Navy needs to stay fully engaged in space in order to achieve its goals of network centric warfare and knowledge superiority for the naval warfighter," says Cmdr. Rausch. "Providing adequate training to develop and maintain a credible space expertise within the Fleet is absolutely critical to helping us realize those goals."

Retired CWO Heads New Space Training Division

The first director for NAVSPACECOM's Space Education and Training Division is no stranger to the Navy or to military space operations. Curtis Bell, a retired Navy Chief Warrant Officer, reported aboard in June.



Curtis Bell

While he was still in uniform, he completed a two-and-a-half-year tour with NAVSPACECOM in June 2000 as an action officer for the Global Broadcast Service program just prior to his retirement from active duty.

Bell enlisted in the U.S. Navy in 1975 and served as an Aviation Storekeeper and later as a Radioman. At sea, he served on board the aircraft carrier USS *Kitty Hawk* (CV 63), USNS *Spica* (AFS 9) and USS *Nassau* (LHA 4).

His enlisted shore tours included the Strategic Systems Project Office in Washington, D.C., the Naval Computer and Telecommunications Station in Puerto Rico, and the Joint Communications Unit, Pentagon Branch, headquartered in Fort Bragg, N.C. He completed jump school and served as the non-commissioned officer in charge of a special operations communications center for the Joint Special Operations Command and U.S. Special Operations Command at MacDill Air Force Base, Fla.

He received his commission in 1994 through the Limited Duty Officer and Chief Warrant Officer program. Subsequently, he served in Sicily as officer in charge of an antisubmarine warfare communications detachment working directly for the Tactical Support Communications Center. He managed all tactical communications and the distribution of COMSEC material in support of Bosnian operations during a four-year tour just prior to reporting to Naval Space Command in January 1998.

Bell holds a master's degree in adult and higher education from the University of Oklahoma in Norman.



MISSION ACCOMPLISHED:

STS-100 Robotic Arm Added to Space Station

One of the most complex expeditions to the International Space Station (ISS) to date was executed flawlessly during Space Shuttle *Endeavour* mission STS-100, launched on April 19.

The seven-member crew was commanded by Navy Capt. Kent Rominger. It was his fifth space flight since being selected by NASA as an astronaut in 1992. With the landing of STS-100 on May 1, he had logged over 1,600 hours in space.

Serving as pilot for the mission was Navy Capt. Jeffrey Ashby, making his second space flight since his selection as a NASA astronaut in 1994.

In addition to flying the shuttle's ninth assembly mission for the space station, Capt. Ashby also operated *Endeavour*'s robotic arm in a complex operation to install a new-generation robotic arm built by Canada for the ISS.

While at the space station, the *Endeavour* crew also helped transfer more than 6,000 pounds of supplies and equip-

Sporting its newly installed Canadarm2, (top photo) the International Space Station was photographed following separation from the Space Shuttle *Endeavour*. Capt. Jeffrey Ashby (below), STS-100 pilot, prepares to use a camera from the aft flight deck of *Endeavour*.

NASA Photos



ment from the Italian-built "Raffaello" Multi-Purpose Logistics Module. They also installed an ultra-high-frequency communications antenna on the space station. Two space walks were required in order to complete the robotic arm and antenna installations.

STS-105 Expedition 3 Crew Delivered by *Discovery*

Space Shuttle *Discovery* launched on Aug. 10 for mission STS-105, the eleventh shuttle flight to the International Space Station.

Discovery's seven-member crew was commanded by Air Force Col. Scott Horowitz in his fourth space flight. Shuttle pilot for the mission was Marine Major Rick Sturckow, making his second space flight as a NASA astronaut.

On board *Discovery* was the three-member Expedition 3 crew to the space station: expedition commander Navy Captain Frank Culbertson and flight engineers Vladimir Dezhurov and Mikhail Tyurin, both Russian cosmonauts.

STS-105's primary payload was the Leonardo Multi-Purpose Logistics Module provided by the Italian Space Agency. Leonardo is one of three such pressurized modules that serve as the ISS's "moving vans," carrying laboratory racks filled with equipment, experiments and supplies to and from the station aboard the space shuttle.

The unpowered, reusable logistics modules function as both a cargo carrier and a space station module when flown. Mounted in the space shuttle's cargo bay for launch and landing, they are berthed to the station using the shuttle's robotic arm after the shuttle has docked. While berthed to the station, racks of equipment are unloaded from the module and then old racks and equipment may be reloaded to be taken back to Earth.

During their 12 days on orbit, the STS-105 astronauts worked with both the returning Expedition 2 crew and the newly arrived Expedition 3 crew to transfer more than two tons of experiment hardware, food and logistical supplies between *Discovery* and the space station. In addition, mission specialists Daniel Barry and Patrick Forrester performed two space walks to prepare the station for future growth.

Discovery undocked from the ISS on Aug. 20 with Expedition 2 crew members — commander Yury Usachev and flight

(Continued on page 18)

MISSION ACCOMPLISHED:



(Continued from page 17)

engineers James Voss and Susan Helms — embarked for their return to Earth after spending 167 days in orbit. *Discovery* landed two days later at Kennedy Space Center, Fla.

Highlighting the subsequent activities of the Expedition 3 crew on board the space station has been the outfitting and activation of the station's latest addition, a four-ton Russian airlock and docking port named Pirs that arrived at the orbiting complex on Sept. 16.

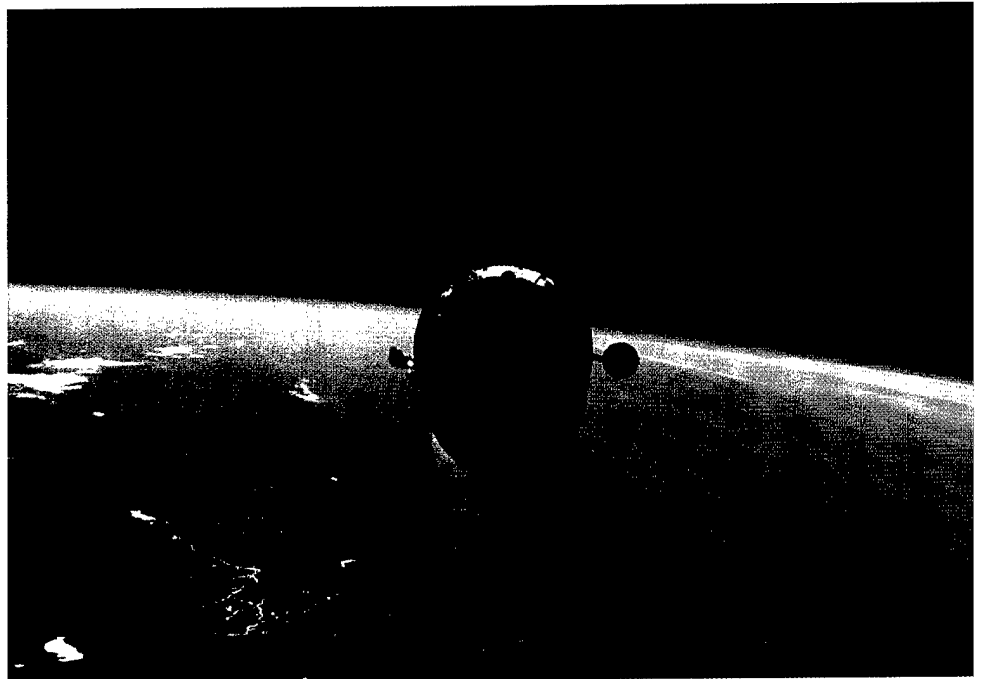
The 16-foot long Pirs, with a 20-foot instrumentation and propulsion segment still attached, is now docked to the Earth-facing port of the station's Zvezda service module. Pirs provides the station with an airlock for use with Russian Orlan space suits and a new docking port.

As well as working in Pirs, the crew has continued scientific investigations with experiments that study spinal cord reflexes during long-duration space flight, gauge the interactions between crew members and ground personnel, and characterize a system that isolates sensitive experiments from vibrations on the station.

The crew has also conducted physical examinations that are done periodically during the flight to gauge the effects of weightlessness.

Tracking the Space Station

The International Space Station is orbiting at an average altitude of 240 statute miles (385 kilometers). With the high 51.6 degree inclination of International Space Station (ISS) — covering 85 percent of the Earth and 95 percent of the Earth's population — there are frequent oppor-



The Russian docking compartment named Pirs (the Russian word for pier) approaches the International Space Station (top photo). Expedition 3 mission commander, Navy Capt. Frank Culbertson, conducts inflight maintenance in the Unity Node 1 on the ISS. NASA Photos

tunities to visually observe both spacecraft from the ground.

Streaking across the sky at 17,500 miles per hour with its new solar arrays fully deployed, Alpha is now the third brightest object in the night sky after the Moon and star Sirius.

NASA provides several websites and an email subscription service to help identify sighting opportunities from your location. Sighting opportunities from the ground for many cities around the world can be viewed at <http://spaceflight.nasa.gov/realdata/sightings/>.

<http://spaceflight.nasa.gov>
NASA's homepage for Human Space Flight offers a universe of information

about the Space Shuttle, ISS and exploration of space. Select the "real time date" tab and then click on "sighting opportunities." The page provides both text-based and web-based listings.

<http://liftoff.msfc.nasa.gov>
NASA's "Liftoff to Education Home Page" offers an automated email notification of sighting opportunities for specific locations and a wealth of space-related educational materials for all age levels. Select "Tracking" then under "Tracking Satellites" scroll down to the "J-pass" predictor; or drill down directly to <http://liftoff.msfc.nasa.gov/RealTime/JPass/PassGenerator/>.

Members of Naval Space Command Detachment Echo in Stuttgart, Germany



Detachment Focus On Quality Improvement Enhances Mission, Esprit de Corps

By Lt. Irvin Gray

Naval Space Command Detachment Echo, the command element responsible for training and deploying Sailors to operate a theater missile warning system, relocated to Kelly Barracks, Army 6th Area Support Group (6th ASG), Stuttgart, Germany in August 2000. Since the homeport change, the Sailors of Det Echo have created an "environment for success" in operator proficiency, professional knowledge and senior enlisted leadership.

Sailors assigned to Det Echo deploy worldwide as operators of the Joint Tactical Ground Station (JTACS), a joint-interest Army-Navy system designed to provide direct tactical support to theater commanders. The system receives, processes and disseminates warning information related to theater missile launches and other tactically significant events to deployed U.S. forces.

Operational JTACS units are currently located in Stuttgart, Ger-

many and Osan, Korea to support U.S. European Command, U.S. Pacific Command and U.S. Central Command.

JTAGS is one component of U.S. Space Command's Tactical Event System (TES) architecture. A completely transportable system, JTAGS will simultaneously process data from up to three Defense Support Program (DSP) satellites. The system is allocated to each theater by U.S. Space Command and links directly into theater communications systems to provide timely and accurate launch location information, impact area prediction and

positional information to support warning and targeting requirements for all services on events critical to theater missile defense.

In August 2000, Naval Space Command's Detachment Echo executed the homeport change to support an increase in mission requirements. After the announcement of the Navy ITEMPO program, implemented in October 2000, Det Echo collocated with JTAGS Europe in Stuttgart, Germany. The homeport change reduced both the ITEMPO deployment days for each Sailor, and TAD requirements by 50 percent, a cost savings of over \$250,000 yearly.

Though these goals have both been met, they came at a cost to both Sailors and families who executed the homeport change while onboard Det Echo. One of the first Sailors on the ground in Germany, YN1(SW) Darren Pickett executed the homeport change with his wife Denise, his daughter Jasmine and his son Darren Jr.

"A lot of personal sacrifices were given on my



OS2(SW) Keith Moore completes his qualification as a secondary operator aboard JTAGS Europe.

Making Mission and Family A Priority

behalf and my family. However, the willingness and hard work of each individual Sailor were essential to the successful completion of the homeport shift to Germany," says Pickett.

Soon after the homeport change, Det Echo focused on three areas for command excellence: quality of support to JTACS, quality of working environment and quality of life for Sailors and family members. In the year that has followed the relocation, Sailors of Det Echo have truly created an environment for success.

Quality of Support to JTACS

Det Echo took advantage of the collocated JTACS site and instituted a sustainment training and proficiency training program for all Sailors preparing to deploy. In an effort to preserve perishable operator skills, no Sailor is out of the JTACS shelter for more than 60 days without either deploying or attending refresher training at JTACS Europe.

In addition to being initially qualified on the JTACS system in an en route Navy Enlisted Classification (NEC) school, all Sailors currently onboard are "site certified" on the fielded theater JTACS unit.

OS2(SW) Terrence McRae, one of the newly reporting Sailors at Det Echo, comments, "I arrived onboard in May (2001) and was site certified at JTACS Europe in June. In order to be an asset to the JTACS program, I want to be knowledgeable and tactically sound during my entire tour and

for all my deployments. I want to qualify as crew chief on my first deployment."

Quality Working Environment

Det Echo is ensuring that the detachment's Sailors are provided the tools to advance, to take pride in their working spaces and to stay Navy.

First of all, Det Echo is focused on providing an environment for success where Sailors can advance and pursue their professional goals. Each week, two hours are dedicated to Professional Military Knowledge and Basic Military Requirement lectures, researched and given a Sailor.

Of five board-eligible E6s, three advanced to Chief Petty Officer in September. Since the homeport change, nine Sailors have advanced to the next higher pay grade. One-hundred percent of the Sailors taking the March E4-E6 advancement exam either passed or advanced.

As a Type 4 Sea-Duty Unit, Det Echo falls under the Navy-wide Command Advancement Program (CAP) established in 1978 as an incentive for seagoing personnel to be recognized for superior performance while working in a rigorous operating environment experienced at sea or while forward deployed.

Det Echo requested from Naval Space Command the authority to advance OS1(SW) Anthony Johnson from E5 to E6 during a site visit in August by Capt. Mary McLendon, director of operations/plans for Naval Space Command.

According to Johnson, "My most rewarding experience at Det Echo was getting advanced to first class. This was a milestone in my career. I was studying two hours a night and taking professional development courses. I had a personal goal to make First Class in eight years. The CAP program rewards Sailors who have done everything they can to advance, but cannot due to time in rate."



Lt. Irvin Gray, officer in charge for Detachment Echo, congratulates OS1 Kevin Vavra on being selected as Naval Space Command Sailor of the Year for 2000.

During a base-wide cleanup effort on Kelly Barracks, Sailors and family members improved the appearance of the Det Echo office building. Using over 20 bags of potting soil and 30 plants provided by 6th ASG self-help, they completely landscaped the outside of the building. Their efforts led to Naval Space Command Det Echo being named the "6th ASG Best Admin Building on Kelley Barracks for Spring Clean-up 2001."

In August, CINCUSNAVEUR requested augmentation for the annual Sharp Eagle Exercise - specifically Intelligence Specialists. Det Echo's IS1 Richard Hankins was selected to take part in the exercise based on his experience working on a flag staff and his rating knowledge.

Clockwise from top: 4N1 (SW) Darren Pickett and his family enjoy a trip to the Stuttgart Wilhelma Zoo, sponsored by the Det Echo Ombudsman program. Machiko and OS2 (SW) William Peters in conversation at "Organizational Day," while their Golden Retriever Sebastian gets a big hug. IS2 Tricia Viviano, her husband Sean and their daughter enjoy "JTAGS Europe/Det Echo Organization Day," attended by families of the Sailors and Soldiers.



While participating in the exercise, IS1 Hankins reenlisted aboard the flagship USS *La Salle* (AGF 3). The flagship with the embarked Commander, U.S. 6th Fleet and staff, transited the narrow Bosphorus Strait that separates Europe and Asia to emerge into the Black Sea for a five-country deployment in mid-August.

Reenlisting was an added bonus. "Senior Chief Otty went above and beyond in supporting retention," says Hankins. "Taking advantage of the Sharp Eagle Exercise, he arranged for me to reenlist onboard the 6th Fleet Flagship and to experience a Black Sea cruise."

Quality of Life

Providing the environment for success at Det Echo includes reaching out to Navy families in a forward deployed environment. An active Ombudsman/Family Readiness Group (FRG) program sponsored by both Det Echo and JTAGS Europe provides families the opportunity to

socialize and to support family quality of life.

In August 2001, the Ombudsman/FRG program sponsored a cruise along the Neckar River that runs through downtown Stuttgart, and offset the entire cost for each Sailor, soldier and spouse through an extensive fundraising campaign.

In addition to recreational activities, Det Echo has a more serious program to support the quality of life for family members: pre-deployment briefs designed for spouses left behind during forward-site deployments. Because the Sailors are deployed individually, each spouse is given the chance to see lessons learned from previous deployments and the area resources for common issues.

In each pre-deployment brief, representatives from Army Community Services, the American Red Cross and Judge Advocate General present solutions to problems and ways to prevent issues that commonly arise during separation. As an added portion of the program, spouses attend a stress management class given by a psychologist at Det Echo that focuses on the problems involved with extended separation.

Using self-help resources provided by the Army 6th Area Support Group - designated to provide base operations support to assigned and attached units - the Sailors and Soldiers assigned to Det Echo and JTAGS Europe completely refurbished an unoccupied barracks.

The working crew included residents of the barracks as well as accompanied Sailors and their family members. Applying over 100 gallons of paint, self-help team drastically improved the appearance of the barracks and made a tremendous impression on residents and non-residents alike.

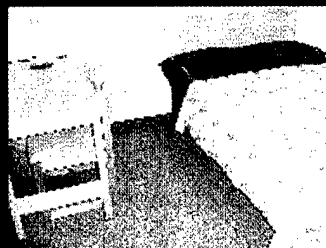
OS2 Kevin Cuevas, though accompanied by his wife Teresa and daughter Brianna, has noticed the difference. "The improvements to the barracks have made a tremendous impact. Although I do not live in the barracks, it serves as an example of the command's dedication to improving living conditions for its members."

Togetherness has become a habit for the Sailors and family members, even during events that are not sponsored. As one example, OS2 (SW) William Peters IV took advantage of the opportunities in Germany and joined the European Rodeo Cowboy Association (ERCA) soon after arriving with his wife, Machiko.

"When I rode in the ERCA Rodeo in Stuttgart, 15 Sailors and family members came to support me," reflects Peters. "The best thing I can say is 'esprit de corps.' Both Det Echo and JTAGS Europe not only focus on the accomplishment of the mission, but the welfare of the Sailors and Soldiers."



Spring Clean-Up team for 2001 earned Det Echo the title of "Best on Kelly Barracks. Managed entirely by the Sailors and Soldiers of Det Echo and JTAGS Europe, the self-help refurbishment of hallways and rooms had a tremendous impact on single service members' quality of life."



Capt. David Buckey Takes Command of Satellite Operations Center

Captain David L. Buckey assumed command of the Naval Satellite Operations Center in July.

Originally from Sacramento, Calif., he was commissioned through Aviation Officers Candidate School in 1981 and designated a Naval Flight Officer the following year.

He served for three years with Fleet Air Reconnaissance Squadron 3 at Naval Air Station Barbers Point, Hawaii, as an EC-130Q mission commander, NATOPS navigation instructor and NATOPS airborne communications officer Instructor.

In subsequent assignments, Capt. Buckey served on board USS *Theodore Roosevelt* (CVN 71) as electronic warfare officer, tactical watch officer and officer of the deck, followed by a tour in the operations directorate of the United States Atlantic Command as the TACAMO Projects Officer.



Capt. Buckey

Capt. Buckey returned to Fleet Air Reconnaissance Squadron 3 in August 1992 for his department head tour flying in the E-6A aircraft. During this tour, he served as tactics officer, assistant maintenance officer and operations officer.

Beginning in 1994, he served for two years with the U.S. Strategic Command as the operations/plans officer for Commander Task Force 124 and Commander, Strategic Communications Wing 1 at Tinker AFB, Okla.

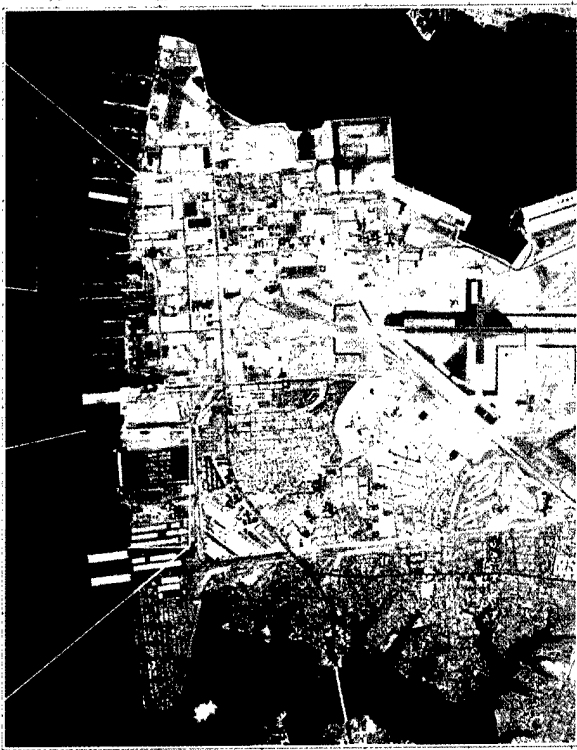
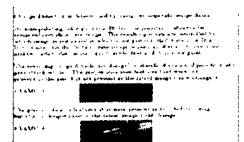
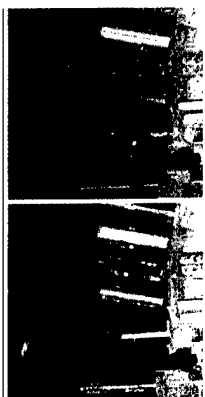
In 1996, Capt. Buckey served as head of the TACAMO Branch in the Survivable Mobile Command Center Systems Management Division within the Opera-

tions Directorate of the U.S. Strategic Command at Offutt AFB, Neb.

Selected for command later that year, he reported to Naval Amphibious Base, Coronado, Calif., and Tactical Air Control Squadron 11 as executive officer. During this tour, he served as air officer for Commander, Amphibious Squadron 1 on board USS *Peleliu* (LHA 5). Deployed to the Persian Gulf, he participated in numerous exercises, contingency operations and Operation Southern Watch.

Capt. Buckey assumed command in April 1998. After his change of command the following May, he reported to USS *John C. Stennis* (CVN 74) for duty as navigator.

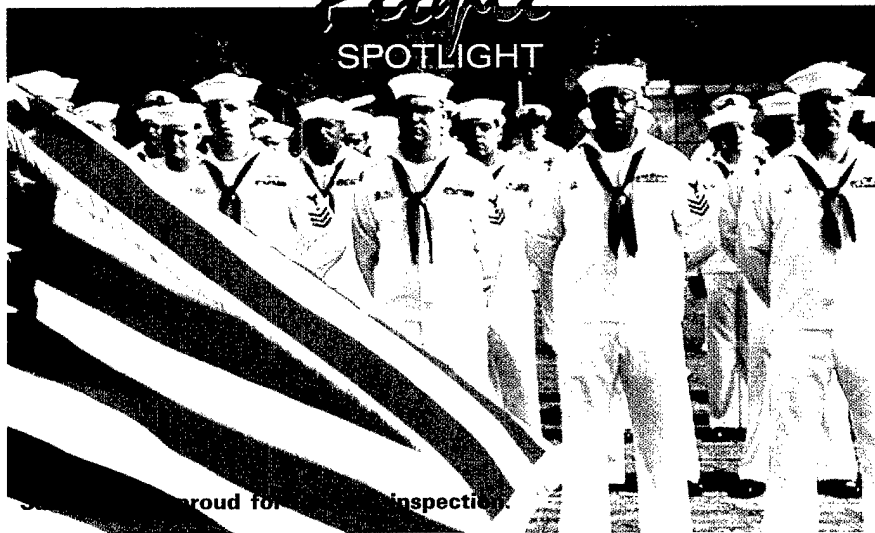
Capt. Buckey holds an undergraduate degree from California State University and a master's degree in national security affairs from the Naval Postgraduate School in Monterey, Calif.



CHANGE DETECTION IMAGERY

Change detection is determined by using two separate image dates. Dates used for this image of Norfolk, Va., were July 5 and Sept. 20, 2000. By manipulating color guns, it is possible to observe two temporal periods in one image. The resulting image details "no change" in standard shades of panchromatic gray. Purple indicates features that were not present in the earlier image, but present in the latest view. Green indicates features present in the early image that no longer exist in the latest view. © 2000 Space Imaging, Inc. (All Rights Reserved). Licensed for US DoD/Title 50 & Coalition Forces use only.

People SPOTLIGHT



Learning To Inspire Students With Space

By Gary R. Wagner

Teachers from six states — some traveling from as far away as California and New York — recently converged on Dahlgren and Fredericksburg for a two-week “double header” graduate-level education program sponsored by Naval Space Command in partnership with the Space Foundation.

The Space Foundation’s course on “Living in Space and Basic Rocketry” was hosted by Naval Space Command at Dahlgren the last week in July. The course is structured to prepare teachers to incorporate space topics into their curriculum and is applicable to all disciplines.

This was the second straight year Naval Space Command has sponsored the course, which was presented by instructors from the Space Foundation, based in Colorado Springs, Colo., along with guest lecturers from the command.

The class syllabus included a tour of Naval Space Command’s operations center at Dahlgren. As a special project, each educator built and launched a model rocket. The teachers also experienced weightlessness during an underwater neutral buoyancy training exercise at the Dahlgren Pool.

The second half of the two-week graduate education program for teachers featured the Space Foundation’s course on “Advanced Technology and Robotics.” Held the first week of August, this week-long class was hosted at Walker-Grant Middle School in Fredericksburg.

Educators from five states, including New York and New Jersey, attended the course, which was offered for the first time in Virginia.

The class focused on artificial intelligence, space technology spinoffs, navigation from space, and training on the use of the Internet in the classroom. Much of the course provided the teachers with

(Please see Teachers on page 24)



Space Foundation instructor Kindra Hill (center) assists Dahlgren School teacher Arlene Wilkinson with the setup for her model rocket launch.

Celebrating Navy’s Role in Space Flight

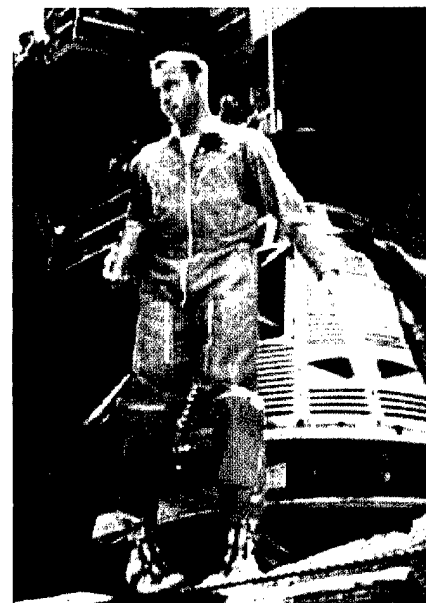
Forty years ago, Navy pilot Alan Shepard made history as the first American to fly in space. His 15-minute flight in the Freedom 7 capsule marked this nation’s first step in the human “space race.”

A Naval Academy graduate (1945), the late Rear Adm. Alan B. Shepard flew Freedom 7 116.5 miles in space on May 5, 1961.

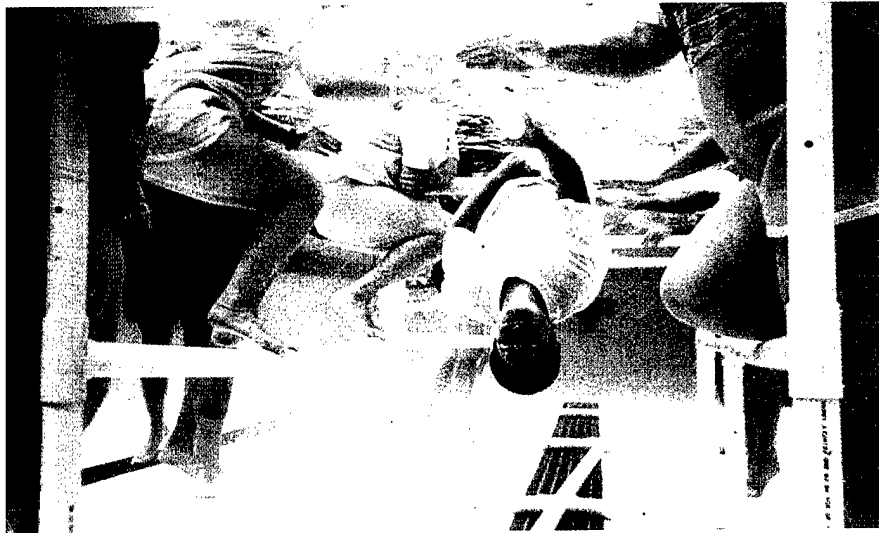
Today, Freedom 7 — one of the most valued treasures from the nation’s space program — is on display in the academy’s Arnel-Leftwich Visitors Center. The visitors center offers an exhibit titled “Grads in Space” sharing USNA alumni accomplishments with midshipmen.

“Alan Shepard was a true pioneer,” said academy Superintendent Vice Adm. John R. Ryan. “He inspired countless numbers of talented men and women to become part of the space program. The Naval Academy produces more astronauts than any other institution in our country. We’re very proud of this, and I’m sure Alan Shepard was, too.”

(Please see Freedom 7 on page 24)



Astronaut Alan Shepard inspects his Freedom 7 capsule on board USS Lake Champlain after his recovery. NASA Photo



Sara Wittel from Riverside, Calif., makes her way through an underwater apparatus designed to replicate the weightlessness astronauts experience.

EDUCATORS PUT TO THE TEST IN ROCKETRY, ROBOTICS COURSES

Teachers

(Continued from page 23)

hands-on experiences in building various types of robots and using them in games and exercises designed to challenge and stimulate students.

Both classes culminated in graduation luncheons that featured NASA astronauts Jeffy Ashby and Kent Rominger as guest speakers. Both captains in the U.S. Navy, they last flew together in space on the Space Shuttle *Endeavour* in May.

Ashby was the pilot and Rominger was the crew commander for that mission, which was responsible for installing the Canadian-built robotic arm and the Raffaello logistics module on the International Space Station.

The astronauts narrated a videotape of their mission and recognized the teachers for their important influence in training today's youth to become "the next generation of space travelers."



Elizabeth Benson, a math and science teacher at St. Mary Star of the Sea School in Indian Head, Maryland, races the clock as she stacks wood blocks using a robotic arm she has built.

Freedom 7

(Continued from page 23)

Shepard's spacecraft, *Freedom 7*, was part of Project Mercury. This program was established in 1958 to orbit and successfully recover a manned satellite and investigate man's ability to function in space. The bell-shaped Mercury spacecraft consists of two sections. The conical lower section housed Shepard and his equipment. A heatshield attached to the base of the lower section enabled the spacecraft to survive the searing heat of atmospheric re-entry. Two parachutes were located in the cylindrical upper section. One stabilized the spacecraft after re-entry; the other lowered it gently to the ocean surface.

After his rapid suborbital flight, this decorated naval officer splashed down in the Atlantic Ocean 302 miles from Cape Canaveral, Fla. Both Shepard and *Freedom 7* were retrieved by helicopter and taken to the aircraft carrier USS *Lake Champlain*.

Freedom 7 was part of "America's Smithsonian," a traveling exhibition seen by thousands of visitors. Since returning from that tour, Allan Needell, chairman of the Space History Division, has worked to make this spacecraft once again available for public display.

"I am extremely proud that we have been able to make arrangements with the Naval Academy to place this spacecraft in the Arnel-Leftwich Visitor Center," Needell said. "I am quite sure it will serve as a meaningful inspiration, not only for the men and women who work and study there, but for the thousands of visitors who come to Annapolis to learn about the Navy and the academy."

"The Naval Academy is honored to display this unique piece of history," says Ryan. "*Freedom 7* will remind our midshipmen and our guests of the many accomplishments of our graduates."

The Naval Academy has produced 50 graduate astronauts, each making significant contributions to America's space program.

Freedom 7 is expected to be on display at the academy until 2003. — *Courtesy Naval Academy Public Affairs*



IT1 Brown



ET3 Spratling



Jon Boers



Kathy Peterson



Michael Patrick

People of the Quarter Recognized

Military and civilian members of Naval Space Command were recently recognized for exceptional performance during January through March of this year.

Petty Officer 1st Class Toby Brown was named Sailor of the Quarter. His award cited his work as an information systems technician in the satellite communications operations branch. He oversees the use of super-high-frequency satellite channels by Navy ships.

Brown joined the Navy in 1988. His Navy assignments have included sea tours aboard the cruiser USS *Virginia* and the mine warfare ship USS *Avenger*.

He has also served with the Mine Warfare Command in Corpus Christi, Texas and with CINCLANTFLT in Norfolk. Brown reported to Naval Space Command in April last year.

Brown's selection as Sailor of the Quarter also recognized his leadership in the community. He serves as president of the First Class Petty Officer's Association and coaches boy's and girl's basketball teams in a local school.

Petty Officer 3rd Class Sandra Spratling, was selected as Junior Sailor of the Quarter. An electronics technician, she is assigned to the communications operations and maintenance branch. She services the a computer network that pro-

vides office automation and operational support to over 250 users at the command's headquarters.

Spratling joined the Navy in 1997 and reported to Naval Space Command in May 1999 following her recruit and technical training.

Jonathan P. Boers was named Senior Civilian of the Quarter. A supervisory physicist in the Naval Space Operations Center (NAVSPOC) Branch, he was commended for his work as mission support officer.

Boers' recent efforts have included training and manning orbital analyst, customer support and technical support crew positions in the NAVSPOC. In addition, he was responsible for validating and integrating multiple significant upgrades to Naval Space Command operational computer systems.

Kathleen M. Peterson, administrative assistant for Naval Space Command Forward in Colorado Springs, Colo., was selected as Civilian of the Quarter.

Her award cited her management of a recent move by the office into new spaces at Peterson Air Force Base. Her attention to details, including physical movement of furniture as well as changes in classified inventories, computers and telephones, ensured continuous support to the staff through the transition.

Michael L. Patrick was named Watchstander of the Quarter in recognition of his performance as a space control analyst in the NAVSPOC.

Patrick was commended for his analyses of several anomalous events occurring in an operational database. His ability to perform these spontaneous, time-critical tasks resulted in a minimal disruption to operations.

April-June

Quarterly awards for April through June 2001 were presented to the following personnel.

Petty Officer 1st Class Rachel A. Eisner was named Sailor of the Quarter. Her award cited her work as the administrator for a key message-handling system in the Joint Information Processing Center.

Particular accomplishments noted included her efforts to write standard operating procedures for troubleshooting system outages, as well as an update to job qualification requirements for the system.

Originally from Oak Harbor, Wash., Eisner has served in the Navy since 1994. Her other tours have been with NSA at Souda Bay, Greece, and with the Naval Security Group Activity in Puerto Rico.

James F. Ridgway was named Senior Civilian of the Quarter. A computer specialist in the Information Systems Division (N6), he was commended for his work as information system security officer and N6 exercise coordinator.

His award recognized his efforts to bring existing command firewalls into compliance with Navy policy and to obtain state-of-the-art firewalls for improved security. He also served as an exercise coordinator for two major events. During

(Continued on page 26)



CTO1 Eisner



Jim Ridgway



Donna Bowie



Ralph Berry



A record number of Space Race 2001 competitors sprint from the starting line.

Race Celebrates Space

Naval Space Command's annual 5-kilometer "Space Race" on June 22 drew a record turnout of 84 participants.

Leading the field of 55 runners with the fastest times in the men's division was Jose Andres Freire Gato in 1st place (18:54). Gato is a lieutenant in the Spanish Navy, in Dahlgren as an exchange student attending the Aegis Training and Readiness Center.

Other top finishers in the men's division were Gary Wilhelm from Corona, Calif., in 2nd place (20:01), and LT Ken Ebert in 3rd place (21:12).

In the women's division, the top finisher was Clare Palma of Greenville, S.C., in 1st place (20:31). Rachel Taft of

Dahlgren finished in 2nd place (22:15), and Megan Raddatz, daughter of NAVSPACECOM Naval Reserve member Cmdr. Gail Raddatz, came in 3rd (23:37).

This year, a total of 15 people entered the skate category in the race. Top finishers were ET1(SW) David Grawl for the men, CTM3 Tanya Nicastrì for the women.

An additional 15 people entered the walk category. The quickest steppers were Lt.Col. Mario Carmo for the men, Joycelyn Jose-Harris of Dahlgren for the women.

In an awards ceremony following the race, Rear Admiral Richard J. Mauldin, commander for Naval Space Command, presented congratulatory certificates and command coins to the winners.

Quarterly Awards

(Continued from page 25)

Apollo Force '01 he devised innovative training injects, and for the Ambitious Immortal INFOCON exercise, he worked with all levels of command to assess the impact of increasingly stringent security measures.

Donna J. Bowie was selected as Civilian of the Quarter in recognition of her performance as Intelligence/Operations Division secretary.

Her noted accomplishments included training and mentoring a newly hired secretary for the Training Division. She was also commended for her contributions to numerous command activities and projects, including Family Day and Space Race 2001, as well as continuing to serve as the command's Red Cross blood drive coordinator.

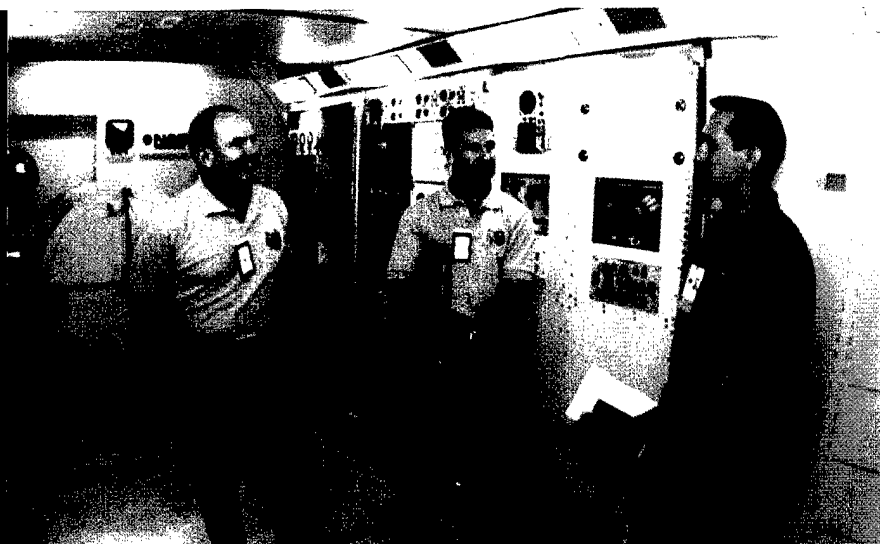
Ralph J. Berry was named Watchstander of the Quarter. A senior orbital analyst in the Naval Space Operations Center, his award recognized his "quick reaction and invaluable expertise" in maintaining watch operations in support of the Fleet and Fleet Marine Force.

In particular, he was commended for his work in quickly resolving database problems to enable the NAVSPOC to provide vital satellite vulnerability data with minimal disruption.

Space Center Tour

Rear Admiral Richard Mauldin (left), commander for Naval Space Command, and his aide, Lt.j.g. John Gay, are briefed on the International Space Station (ISS) by astronaut and Navy Lt.Cmdr. William Oefelein (right).

They are standing inside a mockup of the Japanese Experimentation Module (JEM) used for astronaut training at NASA's Johnson Space Center in Houston, Texas. The JEM is scheduled to be delivered to ISS in 2003 or 2004. Lt.Cmdr. Oefelein, a Naval Aviator flying the F/A-18, was selected as an astronaut candidate in 1998 and is in training for upcoming space flights.



Decorated Service & Special Recognition

Legion of Merit
Capt. Allen A. Efraimson
Cmdr. Denise D. Fite

Meritorious Service Medal
Cmdr. Raymond J. Lewis
Lt.Cmdr. Michael Finnegan
CWO4 Christopher D. Brown

Navy & Marine Corps
Commendation Medal
Cmdr. Gail W. Raddatz
Lt.Cmdr. Marie T. Gordon
Lt.Cmdr. John J. Snell
Lt.Cmdr. James O. Wickline
Lt. Kenneth A. Ebert
Lt. Jeffrey J. Carter
Lt. Stacy R. Murch
Capt. Andrew Straley, USMC
Lt.j.g. John E. Gay
NCC(SW) Frank Demmers
OSC Timothy A. Carpenter
NC1 Joseph Parent

Navy & Marine Corps
Achievement Medal
Capt. Brian W. Adams, USA
OSCS Timothy J. Otty
OSC(SW) Tracy L. Henard
YN1(SW) Darren A. Pickett
CTA1(SW) James E. Lewis
EW1(SW) Eric Laursen
EWC(SW) Sean E. Whiteman

EW1(SW) Jeremy A. Crow
OS1 Troy P. Massey
OS2 Rockell R. Powell

Good Conduct Awards
OSC Henry Pickard (7th)
OS2 Brian Weiss (2nd)
IT2 Robert Guillory (2nd)
CTO2 Alishia D. Gore (1st)
CTM3 Tanya Nicastrì (1st)
CTO3 Christina Moretti (1st)

Advancements & Frockings
CDR Valerie L. Reynolds
LCDR Mark Fickel
EWC(SW) Sean E. Whiteman
CTO1 Mark P. MacDonald
CTO2 Alishia D. Gore
CTO3 Christina Moretti
IT3 Pam Boen
IT1 Annette Chivers
IS2 Frances Thomas
IS2 Corey Collins
OS2 Kimberly Harper
CTO1 Rachel Eisner
CTO3 James Nugent
OS1 Troy Massey

Letters of Commendation
OSC(SW) Henry Pickard
EWC(SW) Sean Whiteman
OS3 Kimberly Harper
CTM3 Tanya Nicastrì

CTO3 Maketha Bush
Thomas B. Sanford
Gary R. Wagner
Lt.Cmdr. Brian K. Baldauf
Jonathan P. Boers
CTA1(SW) James E. Lewis
Kathleen M. Peterson
Michael Patrick
IT1 Toby A. Brown
ET3 Sandra L. Spratling
James F. Ridgway
Donna L. Bowie
Ralph J. Berry
CTO1 Rachel A. Eisner
OS2 Willie G. Mitchell Jr.

Letters of Appreciation
James M. Rose Jr.
Wendolyn S. Brown
Betty C. Buck
Stephen G. Walters
Virginia B. Stumpf
Ralph J. Berry
Michael L. Patrick
Wayne L. Slater
Gary W. Palmore
Eugene H. Mullen
Elmer E. Clair
Patrick M. Kearns
Lisa S. Harris
Clyde M. Cannon

Meritorious Civilian
Service Award
Ernest Mora, head of the
Facilities Management
Department at the Naval
Satellite Operations Center
in Point Mugu, Calif.,
received the Meritorious
Civilian Service Award for
his contributions over the
past two years aimed at
improving the material
condition of the command.

PRT High Scores
Fourteen Naval Space Com-
mand members received an
outstanding or excellent
score during the spring 2001
Physical Readiness Test.

Lt. Kenneth A. Ebert
Cmdr. Cheryl D. Blake
Capt. Mary B. McLendon
Lt. James S. Brown
EW1(SW) Jeremy A. Crow
BUC(SCW) Rodney Gardner
Lt.Cmdr. Michael G. Larios
YN1 Eric J. Wright
Lt.Cmdr. Thomas P. Crook
EWCS Thomas J. Pishock
Cmdr. Matthew G. Rausch
Lt. Richard D. Stevens
ETC William C. Decker
ETCS Warren J. Gray

Civilian Length of Service Awards



Diane Anderson



Phil LaTulippe



Patricia Langley



Ralph Berry



Jean Rowe



Robert Taylor

35 Years

Diane M. Anderson
Philip J. LaTulippe
Patricia S. Langley
Ralph J. Berry
Jean Q. Rowe

30 Years

Stephen D. Balch
Robert E. Taylor

25 Years

Sandra A. Bone
Gerelyn M. Munger
Kathleen H. Sargent

20 Years

James F. Ridgeway
Harold W. Meyers Jr.
Wendolyn S. Brown
Larry C. Gallup

Gary W. Palmore
Kathy S. Jones

15 Years

William K. Raiford
Donna L. Bourne

10 Years

John P. Metts III
Bruce I. Thoenke



Sandy Bone



Kathleen Sargent

CALENDAR

Meetings & Symposia

Precise Time and Time Interval (PTTI) Systems and Applications Meeting, Nov. 27-29, Long Beach, Calif. Sponsored by Naval Observatory, Naval Research Laboratory, Defense Information Systems Agency, NASA. Register on line at <http://tycho.usno.navy.mil/ptti.html>.

2001 Core Technologies for Space Systems Conference, Nov. 28-30, Colorado Springs, Colo. Sponsored by American Institute of Aeronautics & Astronautics, American Astronautical Society. Call (719) 550-5671 or visit web site at <http://www.spacecoretech.org>.

2002 Western Conference & Exposition, Jan. 15-17, 2002, San Diego, Calif. Sponsored by AFCEA and U.S. Naval Institute. Call (703) 631-6126 or visit web site at <http://www.west2002.org>.

Satellite 2002, March 6-8, 2002, Washington, D.C. Sponsored by Via Satellite. Call (888) 707-5811 or visit web site at <http://www.satellite2002.com>.

Global Air & Space 2002 International Business Forum and Exposition, April 22-24, 2002, Arlington, Va. Organized by the American Institute of Aeronautics & Astronautics (AIAA). Call (800) 739-4424 or (703) 264-7535.

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- Fundamentals of Orbital & Launch Mechanics, Nov. 12-15, Laurel, Md., and April 22-25, 2002, Cape Canaveral, Fla.
- Fundamentals of Synthetic Aperture Radar, March 11-12, 2002, Laurel, Md.
- Geomatics - GIS, GPS and Remote Sensing, Oct. 29-31, Laurel, Md.
- GPS Technology, April 16-19, 2002, Cape Canaveral, Fla.
- Satellite Communication Systems Engineering, March 18-20, 2002, Washington, D.C.
- Satellite RF Communications & Onboard Processing, March 5-7, 2002, Cleveland, Ohio.
- Space Systems I, Feb. 4-8, 2002, Laurel, Md.
- Space Systems II, Feb. 11-15, 2002, Laurel, Md.

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